



PORLAND HARBOR RI/FS

ROUND 3 PRE-BREEDING WHITE STURGEON (*ACIPENSER TRANSMONTANUS*) TISSUE DATA REPORT

DRAFT

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

February 29, 2008

Prepared for
The Lower Willamette Group

Prepared by
Windward Environmental LLC
and
Integral Consulting Inc.

WE-08-0001



PORLAND HARBOR RI/FS

ROUND 3 PRE-BREEDING WHITE STURGEON (*ACIPENSER TRANSMONTANUS*) TISSUE DATA REPORT

DRAFT

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

February 29, 2008

Prepared for
The Lower Willamette Group

Prepared by
Windward Environmental LLC
and
Integral Consulting Inc.

WE-08-0001

Recommended for Inclusion in Administrative Record

TABLE OF CONTENTS

LIST OF TABLES	iv
LIST OF ACRONYMS.....	v
1.0 INTRODUCTION.....	1
2.0 SAMPLE COLLECTION ACTIVITIES	2
3.0 SAMPLE PREPARATION, CHEMICAL ANALYSES, AND DATA MANAGEMENT	3
3.1 Sample preparation	3
3.2 Chemical Analyses	3
3.3 Data Validation.....	7
3.4 Data Quality And Usability	8
3.4.1 Quality Control Samples	9
3.4.2 Summary of Qualified Data	10
3.5 Laboratory Deviations from the QAPP	10
3.6 Data Management.....	11
4.0 ROUND 3 RESULTS	14
5.0 REFERENCES.....	46

Appendix A. EPA-LWG Communications

Appendix B. Data Quality Summary

Appendix C. Data Validation Reports

Appendix D. SCRA Database, Excel® Flat File Format

LIST OF TABLES

Table 3-1. Laboratory Methods for Round 3 Sturgeon (<i>Acipenser transmontanus</i>) Whole-body Tissue and Stomach Content Samples	5
Table 3-2. Data Validation Qualifiers and Definitions	7
Table 3-3. Percent Completeness by Parameter Group	9
Table 4-1. Round 3 White Sturgeon (<i>Acipenser transmontanus</i>) Whole-Body Weight and Length Measurements	14
Table 4-2. Round 3 White Sturgeon (<i>Acipenser transmontanus</i>) Gender and Liver and Stomach Content Weights	14
Table 4-3. Age Analysis Results for White Sturgeon (<i>Acipenser transmontanus</i>) Pectoral Fin Ray Samples	15
Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples	16
Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples	24

LIST OF ACRONYMS

Axys	Axys Analytical Services, Ltd.
BERA	baseline ecological risk assessment
CAS	Columbia Analytical Services, Inc.
CLP	Contract Laboratory Program
CVAA	cold vapor atomic absorption spectrometry
EDD	electronic data deliverable
EPA	US Environmental Protection Agency
EQuIS	Environmental Quality Information System
FSP	field sampling plan
FSR	field sampling report
GC/ECD	gas chromatography/electron capture detection
GC/FPD	gas chromatography/flame photometric detection
GC/MS	gas chromatography/mass spectrometry
GFAA	graphite furnace atomic absorption spectrometry
HRGC/HRMS	high-resolution gas chromatography/high-resolution mass spectrometry
ICP/AES	inductively coupled plasma/atomic emission spectrometry
ICP/MS	inductively coupled plasma/mass spectrometry
Integral	Integral Consulting Inc.
LWG	Lower Willamette Group
NOAA	National Oceanic and Atmospheric Administration
ODFW	Oregon Department of Fish and Wildlife
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCDD/F	polychlorinated dibenzo- <i>p</i> -dioxin/furan
PSEP	Puget Sound Estuary Program
QA	quality assurance
QC	quality control
QAPP	quality assurance project plan
RI/FS	remedial investigation and feasibility study
RM	river mile
SCRA	site characterization and risk assessment
SDG	sample delivery group
SIM	selected ion monitoring
SOP	standard operating procedure
SVOC	semivolatile organic compound
Trustees	Natural Resource Trustees

1.0 INTRODUCTION

As part of the Round 3 tissue sampling effort within the Portland Harbor Superfund site (River Mile [RM] 2.0 to RM 11), hereafter referred to as the Study Area, 15 pre-breeding white sturgeon (*Acipenser transmontanus*) were collected between February 19 and March 6, 2007, for chemical analysis. Determining the concentrations of selected chemicals in pre-breeding white sturgeon tissue will facilitate the completion of the baseline ecological risk assessment (BERA), as outlined in the *Portland Harbor Remedial RI/FS Programmatic Work Plan* (Integral et al. 2004).

The specific objective of the Portland Harbor Round 3 pre-breeding white sturgeon tissue sampling effort was to obtain site-specific pre-breeding white sturgeon whole-body tissue samples for use in determining whether chemicals of interest in field-collected white sturgeon tissue from the Study Area potentially pose unacceptable ecological risks to the sturgeon themselves. A detailed description of the Round 3 pre-breeding white sturgeon (*A. transmontanus*) tissue collection effort is included in the field sampling report (FSR) (Windward 2007b).

The remaining sections of this document include a summary of the data collection activities (Section 2.0); details on the laboratory sample analyses, data quality reviews, data management, and laboratory deviations (Section 3.0); results (Section 4.0); and references (Section 5.0).

Supporting information is provided in the following four appendices:

- **Appendix A:** EPA-LWG Communications
- **Appendix B:** Data Quality Summary
- **Appendix C:** Data Validation Reports
- **Appendix D:** SCRA Database, Excel® Flat File Format

2.0 SAMPLE COLLECTION ACTIVITIES

This section summarizes the Round 3 pre-breeding white sturgeon (*A. transmontanus*) tissue collection activities that took place during the 2007 sampling event.

Sampling of pre-breeding white sturgeon (*A. transmontanus*) was conducted in five reaches within the Study Area, between RM 2 and RM 11 in February and March 2007. A total of 403 white sturgeon were collected using set lines and by angling. Of this number, 384 were smaller than the legal size and subsequently released at the site of capture. Of the 19 legal-sized (42- to 60-in.) sturgeon collected, 1 was released accidentally, and 3 were released because the target quota for the reach in which they were caught had been met. One sublegal-sized (28-in.) sturgeon was retained for use as a practice specimen, as approved by the Oregon Department of Fish and Wildlife (ODFW) (Scientific Taking Permit Number OR2007-3840M4) and noted in the FSR (Windward 2007a).

In accordance with the field sampling plan (FSP) (Windward 2007a), 16 sturgeon (3 from each reach and 1 practice sturgeon as noted above) were retained and transferred live to the field laboratory for initial processing. Blood plasma samples were collected in the field laboratory by a representative of the Natural Resource Trustees (Trustees) for their use before each sturgeon was euthanized. Whole-body measurements were taken and initial health assessments were then conducted in accordance with the FSP (Windward 2007a). Finally, each sturgeon was dissected to remove the liver, retrieve the gastrointestinal tract, remove the stomach contents, and remove the pectoral fin ray.

In compliance with the FSP (Windward 2007a) and as discussed in the FSR (Windward 2007b), after initial processing and dissection at the field laboratory, all sturgeon tissue samples (whole body, liver, and stomach contents) collected during the Round 3 sampling effort were stored frozen at -20°C at the field laboratory until the samples could be transferred to Columbia Analytical Services, Inc. (CAS), in Kelso, Washington, and final procedures for additional processing, homogenization, and analysis could be determined. At CAS, whole-body tissue and stomach content samples were homogenized and composited (if applicable), and the analyses performed as described in Sections 3.1 and 3.2 of this report.

In addition, pectoral fin ray samples were collected and submitted to Ruth Farr and Michele Weaver at ODFW for age analysis. Age was determined by counting annuli at least twice by two independent readers following ODFW protocols (Beamesderfer et al. 1998). Details regarding station navigation and positioning; record keeping; and sample processing, handling, and storage are presented in the FSR (Windward 2007b).

3.0 SAMPLE PREPARATION, CHEMICAL ANALYSES, AND DATA MANAGEMENT

The following subsections describe sample homogenization, chemical analysis, and data validation of the whole-body tissue and stomach content samples and includes a summary of data quality and any deviations from the analytical methods detailed in the Round 2 quality assurance project plan (QAPP) and QAPP Addendum 6 (Integral and Windward 2004, 2005). The data management subsection describes the data validation process from the receipt of the laboratory data package to the generation of a final validated electronic data deliverable (EDD). Furthermore, it describes how the site characterization and risk assessment (SCRA) database was compiled into a series of compatible Excel® tables, which were then distributed to the SCRA data users. Data validation reports are provided as Appendix C.

3.1 SAMPLE PREPARATION

Sample preparation of each sturgeon at CAS included the removal of a small piece of muscle tissue for use by the Trustees, preparation of a subsample of the liver for the Trustees, and preparation of a reconstituted whole-body homogenate for chemical analysis by the Lower Willamette Group's (LWG's) subcontractor laboratories.

The standard operating procedure (SOP) for the preparation of the sturgeon samples (Integral 2007) is provided in Appendix A. The SOP was developed by representatives of the US Environmental Protection Agency (EPA), the tribes, LWG, and CAS based on the processing of the practice sturgeon at CAS on June 12, 2007. The processing of the first sturgeon was also observed by EPA and LWG on June 26, 2007.

As described in the SOP, a 40- to 45-g piece of muscle tissue with skin was removed from each fish prior to homogenization and provided to the Trustees. A subsample of each liver was also provided to the Trustees. The liver and body of each sturgeon were homogenized separately at CAS. Portions of the body and liver tissue for each sturgeon were then recombined in proportion to their weights to prepare a reconstituted whole-body sample for each fish (Appendix A).

3.2 CHEMICAL ANALYSES

Chemical analyses were performed on the 15 reconstructed whole-body sturgeon samples, three stomach content samples, and several field quality control (QC) samples as described below. Only two stomach content samples (LW3-SG003-001 and LW3-SG004-001) met the minimum volume requirements to perform the analyses specified in the FSP. In addition, EPA and LWG agreed to create one

composite sample (LW3-SG001005-COMP) from all stomach content samples collected from the remaining sturgeon with insufficient mass for individual stomach content samples throughout the Study Area and analyze the sample for polycyclic aromatic hydrocarbons (PAHs), metals, and total solids. EPA also directed that the lipids be added to the analyses of all three stomach samples and that pesticides and polychlorinated biphenyls (PCBs) be added to the analysis of sample LW3-SG004-001 (Appendix A).

Chemical analyses of the sturgeon whole-body tissue and stomach content samples were performed by two laboratories: CAS, and Axys Analytical Services, Ltd. (Axys), of Sidney, BC, Canada. CAS completed all tissue analyses for phthalates and selected semivolatile organic compounds (SVOCs), PAHs, mercury and other metals, butyltin compounds, and total solids. CAS also performed the lipids analysis on stomach content samples. Axys completed analyses of lipids (in whole-body tissue samples), organochlorine pesticides (with the addition of hexachlorobenzene and hexachlorobutadiene), PCB congeners, and dioxins and furans.

The laboratories and methods of analysis for the tissue samples are included in Table 3-1. The tissue samples were analyzed according to the analytical procedures provided in the Round 2 QAPP and Addendum 6 (Integral and Windward 2004, 2005) and the SOP for homogenization of sturgeon (Integral 2007). Deviations from the Round 2 QAPP and Addendum 6 are noted in Section 3.5.

Table 3-1. Laboratory Methods for Round 3 Sturgeon (*Acipenser transmontanus*) Whole-body Tissue and Stomach Content Samples

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Total solids	CAS	CAS SOP	Freeze dry	CAS SOP	Balance
Metals					
Aluminum, antimony, arsenic, cadmium, copper, lead, nickel, silver, zinc	CAS	EPA 3050B/PSEP	Acid digestion	EPA 6020	ICP/MS
Chromium		EPA 3050B/PSEP	Acid digestion	EPA 6010B	ICP/AES
Selenium		EPA 3050B/PSEP	Acid digestion	EPA 7740	GFAA
Mercury		EPA 7470	Acid digestion/oxidation	EPA 7470	CVAA
Butyltin compounds	CAS	Krone et al. (1989)	Solvent extraction Derivatization	Krone et al. (1989)	GC/FPD
Semivolatile organic compounds		EPA 3541 EPA 3640A	Automated Soxhlet extraction Gel permeation chromatography	EPA 8270C-SIM	GC/MS-SIM
Polycyclic aromatic hydrocarbons	CAS	EPA 3541 EPA 3640A EPA 3630C	Automated Soxhlet extraction Gel permeation chromatography Silica gel cleanup	EPA 8270C-SIM	GC/MS-SIM
Lipids	Axys	EPA 3540C ^a	Soxhlet extraction	Axys SOP	Balance
	CAS	EPA 3541 ^b	Automated Soxhlet extraction	NOAA (1993)	Balance
PCB congeners ^c	Axys	EPA 1668A	Soxhlet extraction	EPA 1668A	HRGC/HRMS
			Gel permeation chromatography		
			Acid/base silica column		
			Florisil® chromatography		
			1% deactivated basic alumina		
Chlorinated dioxins and furans			Soxhlet extraction		
			Gel permeation chromatography		
			Acid/base silica column		
			Florisil® chromatography		
			Carbon celite		
			Layered silver nitrate/acid/base silica		
			1% deactivated basic alumina		

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 3-1. Laboratory Methods for Round 3 Sturgeon (*Acipenser transmontanus*) Whole-body Tissue and Stomach Content Samples

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Organochlorine pesticides and selected SVOCs ^d	Axys	Axys SOP	Soxhlet extraction Gel permeation chromatography Acid/base silica column Florisil® chromatography 1% deactivated basic alumina	Axys SOP	HRGC/HRMS

Axys – Axys Analytical Services, Ltd.

CAS – Columbia Analytical Services, Inc.

CVAA – cold vapor atomic absorption spectrometry

EPA – US Environmental Protection Agency

GC/ECD – gas chromatography/electron capture detection

GC/FPD – gas chromatography/flame photometric detection

GC/MS – gas chromatography/mass spectrometry

GFAA – graphite furnace atomic absorption spectrometry

HRGC/HRMS – high-resolution gas chromatography/high-resolution mass spectrometry

ICP/AES – inductively coupled plasma/atomic emission spectrometry

ICP/MS – inductively coupled plasma/mass spectrometry

NOAA – National Oceanic and Atmospheric Administration

PCB – polychlorinated biphenyl

PSEP – Puget Sound Estuary Program

SIM – selected ion monitoring

SOP – standard operating procedure

SVOC – semivolatile organic compound

^a PCDD/Fs, PCBs, pesticides, and lipids were analyzed from the same extract.

^b PAHs and lipids were analyzed from the same extract.

^c Includes all 209 congeners and analyses for PCB congener homologs.

^d The SVOCs hexachlorobenzene and hexachlorobutadiene were analyzed with the pesticides to improve detection limits as described in QAPP Addendum 6 (Integral and Windward 2005). Hexachlorobenzene and hexachlorobutadiene were also analyzed with the SVOCs.

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

3.3 DATA VALIDATION

Because of the small number of Round 3 sturgeon samples collected, 100% of the sturgeon data was fully validated using procedures specified in the Round 2 QAPP (Integral and Windward 2004). The data validation subcontractor for the Round 3 sturgeon tissue was EcoChem, Inc., located in Seattle, Washington.

The inorganic, organic, PCB congener, and polychlorinated dibenzo-*p*-dioxin/furan (PCDD/F) data were validated in accordance with guidance specified in the EPA Contract Laboratory Program (CLP) national functional guidelines for inorganic and organic data review (EPA 2004, 1999b, 2002b), in EPA Region 10 SOPs for validation of PCB congener data and PCDD/F data (EPA 1995, 1996, 1999a), and in *Guidance on Environmental Data Verification and Validation* (EPA 2002a). Modifications were made to the functional guidelines to accommodate quality assurance/quality control (QA/QC) requirements of the non-CLP methods that were used for this project. Data qualifiers were assigned during data validation if applicable control limits were not met in accordance with the EPA data validation guidelines and the QC requirements included in the referenced methods. The data validation qualifiers and definitions are summarized in Table 3-2.

Table 3-2. Data Validation Qualifiers and Definitions

Data Qualifier	Definition
U	The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
UJ	The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.
UT	The material was analyzed for, but was not detected. The associated sample quantitation limit was mathematically derived (e.g., from calculating the average of multiple results for a single analyte) or was selected for reporting in preference to other available results (e.g., for parameters reported by multiple methods).
J	The associated numerical value is an estimated quantity.
JT	The associated numerical value is an estimated quantity that was mathematically derived (e.g., from calculating the average of multiple results for a single analyte) or was selected for reporting in preference to other available results (e.g., for parameters reported by multiple methods).
R	Rejected.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
T	The associated numerical value was mathematically derived (e.g., from calculating the average of multiple results for a single analyte) or was selected for reporting in preference to other available results (e.g., for parameters reported by multiple methods).

The following laboratory deliverables were reviewed during full data validation:

- Case narrative discussing analytical problems (if any) and procedures
- Chain-of-custody documentation and laboratory sample receipt logs
- Instrument calibration results
- Method blank results
- Results for laboratory QC samples required by the referenced method, including laboratory control sample/laboratory control sample duplicate analyses, surrogate recoveries, and other method-specific QC samples (e.g., serial dilutions for inductively coupled plasma analyses)
- Results for field QC samples (i.e., equipment blanks, field duplicates, and field split samples)
- Analytical results for the tissue samples.

In addition to the review and assessment of the documentation identified above, the data validation included the verification of calculations of reported concentrations for the field and QC samples, verification of intermediate transcriptions, and review of instrument data such as mass spectra to verify analyte identification procedures.

Upon completion of the data validation activities for each sample type, a data quality report and a tabular summary of qualified data were generated by EcoChem. The EcoChem data quality reports are included in Appendix C. Data qualifiers that were assigned during validation were added to the laboratory EDDs by EcoChem. The revised EDDs and the hard-copy data validation reports were submitted as the project deliverable. The revised EDDs were then incorporated into the project database, as described in Section 3.6.

3.4 DATA QUALITY AND USABILITY

Data generated in the field and at the laboratories were verified and validated according to the criteria and procedures described in the Round 2 QAPP and QAPP Addendum 6 (Integral and Windward 2004, 2005). Data quality and usability were evaluated based on the results of the data validation and the data quality objectives for the Round 2 data.

The performance criteria in the QAPP included goals for precision, accuracy, representativeness, completeness, and comparability of the Round 2 data.

Completeness is calculated by comparing the total number of acceptable data (non-rejected data) to the total number of data points generated. Completeness for the Round 3 sturgeon chemistry data was greater than 99% overall, which exceeds the QAPP completeness objective of 95%. Completeness for the Round 3 sturgeon tissue data is summarized by parameter group in Table 3-3. Completeness ranged from 80 to 100% for the individual parameter groups.

Table 3-3. Percent Completeness by Parameter Group

Analysis	Total Number of Data Points ^a	Number of Data Points		Completeness (%)
		Accepted	Rejected	
Butyltins	64	64	0	100
Conventionals ^b	38	38	0	100
Dioxin/furan homologs	160	160	0	100
Dioxins/furans	240	240	0	100
Metals	228	228	0	100
Organochlorine pesticides	442	442	0	100
PAHs	323	323	0	100
PCB congeners	2,703	2,703	0	100
Phenols	80	64	16	80
Phthalates	96	96	0	100
SVOCs	178	178	0	100
Round 3 Sturgeon Tissue Sampling Project Total	4,552	4,536	16	> 99

^a Totals include split sample and exclude homogenization blanks.

^b Lipids, total solids.

The validation reports (Appendix C) provide detailed information on the data quality issues and data validation qualifiers for each tissue type and parameter group.

3.4.1 Quality Control Samples

QC samples were prepared in the laboratories to monitor the bias and precision of the sample preparation and analysis procedures. In addition, a sample of the bait (pickled squid) was analyzed to evaluate the potential for the bait to contaminate the sturgeon tissue.

In accordance with the FSP, QC samples prepared in connection with sturgeon preparation procedures included a split sample and two homogenization equipment blanks. A split (i.e., duplicate) whole-body sample (sample LW3-STWB004-01-2) was created at CAS from sample LW3-STWB004-01-1 after sample homogenization was completed. A homogenization equipment blank was created at CAS in connection with each sturgeon tissue matrix preparation (i.e., reconstructed

whole-body and stomach contents) and analyzed for the same suite of chemicals as those for the associated tissue samples. Results for the split sample and the bait sample are summarized in Appendix B.¹

Additional sample mass from the whole-body samples was also used by the laboratories to analyze laboratory QC samples, such as matrix spike, matrix spike duplicate, and laboratory duplicate analyses. Because of the limited sample volume, no post-homogenization split samples were prepared for the sturgeon stomach content samples.

3.4.2 Summary of Qualified Data

Data not meeting the data quality criteria were qualified as undetected, estimated, tentatively identified, or rejected during validation, in accordance with the QAPP. A tabular summary of the results, with the data qualifiers, is provided in Section 4.0. A complete list of qualified results with reason codes is provided in Appendix B. Data qualified as undetected are usable for all intended purposes. Data qualified as estimated or tentatively identified are usable for all intended purposes with the knowledge that these data may be less precise or less accurate than unqualified data. Rejected data are not usable for any purpose. Concentrations associated with rejected data have been removed from the database, and an “R” qualifier has been retained to flag the results that were removed.

3.5 LABORATORY DEVIATIONS FROM THE QAPP

This section discusses several deviations from the FSP and the SOP for sturgeon homogenization related to subsamples for the Trustees and sturgeon processing procedures and analyses. Deviations from the FSP that occurred during sample collection were addressed in the FSR (Windward 2007b). Laboratory procedures were completed as described in the Round 2 QAPP and Addendum 6 (Integral and Windward 2004, 2005) without deviation. Results and control limit exceedances for QA/QC samples and procedures are discussed in Appendices B and C.

According to the FSP and related discussions with EPA (Appendix A), a 40-g subsample of liver tissue from each sturgeon was to be relinquished to the Trustees for analysis only if this could be done without compromising the integrity of remaining the whole-body tissue samples. Because of the limited quantity of liver tissue obtained, several options for the analysis of the liver and representative whole-body samples were discussed between LWG and EPA (Appendix A). The final procedures used for the preparation of the sturgeon whole-body and liver

¹ The potential effects of the bait contaminants on whole-body tissue and stomach content results are discussed in Section 3.2.2 of Appendix B.

tissue samples are documented in the SOP for the homogenization of sturgeon tissue (Integral 2007).

Only two stomach content samples (LW3-SG003-01 and LW3-SG004-01) met the minimum volume requirements for the analysis of metals, PAHs, and total solids, as specified in the FSP (Windward 2007a). Because of the limited amount of stomach tissue available, EPA and LWG agreed to create and analyze one composite sample from all stomach content samples collected from the remaining sturgeon. As directed by EPA (Appendix A), all three stomach samples were also analyzed for percent lipids, and pesticides and PCBs were added to the analysis of sample LW3-SG004-01.

Procedures for sturgeon homogenization described in the SOP (Appendix A) were modified after discussion with CAS and EPA to avoid the addition of excessive quantities of dry ice to the grinder during sample homogenization. Sufficient time was allowed for samples to be frozen after the primary homogenization was completed and prior to secondary homogenization. The modified procedure reduced the possibility of contamination and allowed more complete homogenization of the samples. A protocol modification form describing these modifications is included in Appendix A.

3.6 DATA MANAGEMENT

Once the laboratories had completed their internal QA/QC checks, they exported the analytical data (i.e., sample, test, batch, and result information) into comma-delimited text files with data columns arranged in an order that was recognized by the project's Environmental Quality Information System (EQuIS) database. The EDDs were e-mailed to Integral Consulting Inc. (Integral), where they were checked for proper EQuIS structure and appended with specific information that was unknown by the laboratories, such as sampling location and composite, field replicate, and split information. If any problems were found in the structure of the EDDs, the laboratory was notified and asked to correct the problem and resubmit the EDD. Each e-mailed EDD transmission, with the original, unaltered EDD attachment, was stored to document and track the laboratories' delivery of electronic data to Integral.

When the EDDs were correct and complete, they were checked electronically by loading them into the temporary section of Integral's LWG project database. During the loading process, EQuIS checked the EDDs for correct lookup codes (e.g., for analytes, test methods, and sample matrices); for proper relationships for results, tests, batches, and samples (to ensure that all results matched with a test, tests matched with samples, and sample/test pairs matched with batches); and to

ensure that all derived samples (e.g., replicates, splits, and matrix spikes) had corresponding parent samples.

In addition, EQuIS also checked “less important” characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. Any error prevented the EDD from loading until the error was corrected. If errors were found and the errors related to the way the laboratory reported the data or constructed the EDD, the laboratory was notified and asked to correct the problem and resubmit the EDD. If the errors were related to Excel’s® automatic formatting of the date and time fields, for example, then the error was corrected, and steps were taken to avoid a repeat of the problem (e.g., changing default settings in the software). Successfully loaded EDDs were saved to document and track the data that were loaded into Integral’s LWG project database.

Each verified and accurate EDD was provided to the Round 2 data validation contractor (EcoChem) for data review and validation. These EDDs were also stored in a temporary section of the project database, where they could be queried and examined, if desired, until validation was complete. When EcoChem completed validation of the data by sample delivery group (SDG) or small groups of SDGs, they applied validator qualifiers and reason codes to the data in the temporary section of the database. The validated data were then merged into the permanent project database. During the merging process, all previously performed electronic checks were repeated to ensure that nothing was incorrectly modified with the application of the validation results.

Several queries were set up in the permanent project database to translate the data structure to a form compatible with the National Oceanic and Atmospheric Administration’s (NOAA’s) Query Manager. The data translation involved creating station and sample identifiers, converting the sample type code, and changing the date format. The translated data were imported into an Access™ file that was provided by NOAA and contained template tables for the Query Manager structure.

Integral’s LWG project database contains all of the data reported by the analytical laboratories. This includes field and laboratory replicates, laboratory dilutions, results for the same analyte from multiple analytical methods (e.g., SW8270 and SW8270-SIM), and laboratory QA samples such as matrix spikes, surrogates, and method blanks. The data-handling rules described in *Guidelines for Data Averaging and Treatment of Non-detected Values for the Round 1 Database* (Kennedy/Jenks et al. 2004) were used to create a simpler dataset for the SCRA data users: the dataset contained only one result per analyte per sample and excluded all of the laboratory QA results. This involved creating a SCRA database that excluded laboratory QA results, contained only the most appropriate dilution result and analytical method for each analyte, and contained the average of the replicates. Excluding the laboratory QA results was a simple database querying

step. The selection of the most appropriate dilution was either done by the reporting laboratory or by the data validator. The selection of the most appropriate analytical method was described in the guidelines document (Kennedy/Jenks et al. 2004) and was accomplished by flagging the appropriate method in the project database.

The guidelines document (Kennedy/Jenks et al. 2004) described the rules used for averaging data and carrying qualifiers. Because the creation of the SCRA database was the most intensive data manipulation procedure, the data were divided into subgroups, and approximately 40% of each subgroup was verified. If any problems were found with the averaging, then 100% of the subgroup was verified and problems were corrected. The preliminary SCRA database was compiled into a series of database-compatible Excel® tables and distributed to the SCRA data users.

4.0 ROUND 3 RESULTS

Whole-body weights and lengths for the 15 sturgeon as measured in the field laboratory are presented in Table 4-1; gender and liver and stomach content weights are presented in Table 4-2.

Table 4-1. Round 3 White Sturgeon (*Acipenser transmontanus*)
Whole-Body Weight and Length Measurements

Sturgeon ID	Whole-Body Weight (lb ww)	Fork Length (in.)	Total Length (in.)
LW3-ST001-01	14.5	39.5	44
LW3-ST001-02	14	37	43
LW3-ST001-03	22.5	43.5	50.5
LW3-ST002-01	18	37.5	43.5
LW3-ST002-02	13.5	39	44
LW3-ST002-03	17.5	40	45.5
LW3-ST003-01	15	37.5	43
LW3-ST003-02	18	39.5	45
LW3-ST003-03	21	43	48
LW3-ST004-01	21.5	42.5	48
LW3-ST004-02	13	37	42
LW3-ST004-03	13.5	36	42.5
LW3-ST005-01	15.5	41	46.5
LW3-ST005-02	20	42	48
LW3-ST005-03	14.5	37.5	42.5

ID – identification

ww – wet weight

Table 4-2. Round 3 White Sturgeon (*Acipenser transmontanus*)
Gender and Liver and Stomach Content Weights

Sturgeon ID	Liver Weight (g ww)	Stomach Content Weight (g ww)	Gender
LW3-ST001-01	57.2	0	female
LW3-ST001-02	49	2.5	male
LW3-ST001-03	92.1	0.9	female
LW3-ST002-01	58.8	0	male
LW3-ST002-02	59.9	2.1	male
LW3-ST002-03	59.4	0.6	female
LW3-ST003-01	59.3	19.8	male
LW3-ST003-02	77.1	2.1	male
LW3-ST003-03	97.2	1	female
LW3-ST004-01	120.9	112.6	male
LW3-ST004-02	58.6	4.8	male

Table 4-2. Round 3 White Sturgeon (*Acipenser transmontanus*)
Gender and Liver and Stomach Content Weights

Sturgeon ID	Liver Weight (g ww)	Stomach Content Weight (g ww)	Gender
LW3-ST004-03	54.9	2.4	male
LW3-ST005-01	62.4	1.9	female
LW3-ST005-02	98.5	0.5	female
LW3-ST005-03	62.2	2.4	male

ID – identification

ww – wet weight

Results for individual samples are presented in Tables 4-3 (age analysis) and 4-4 (whole-body and stomach contents). The final age determination was performed by the primary reader (Ruth Farr, ODFW), following the methods described by Beamesderfer et al. (1998). The tissue data generated from this effort will be evaluated in conjunction with Round 1, 2, and 3 tissue data and will be reported in the BERA in fall/winter 2008. Qualified chemistry data for tissue samples are included in Table 4-4. A complete list of qualified results with reason codes is provided in the data validation reports in Appendix C. Summary statistics for the tissue and stomach content chemistry samples are compiled in Table 4-5.

Table 4-3. Age Analysis Results for White Sturgeon (*Acipenser transmontanus*) Pectoral Fin Ray Samples

Sample ID	Date	Age as Determined by Michele Weaver ^a			Age as Determined by Ruth Farr ^a			Final Age
		1	2	Final	1	2	Final	
LW3-ST001-01	2/21/07	10	10	10	10	10	10	10
LW3-ST001-02	3/6/07	9	9	9	7	7	7	7
LW3-ST001-03	3/6/07	13	13	13	11	13	13	13
LW3-ST002-01	2/21/07	13	13	13	11	12	12	13
LW3-ST002-02	2/2/2007	11	11	11	10	11	13	11
LW3-ST002-03	2/26/2007	12	10	12	9	10	10	12
LW3-ST003-01	2/22/2007	16	15	16	15	14	15	16
LW3-ST003-02	2/22/2007	16	16	16	17	17	17	17
LW3-ST003-03	3/6/2007	-	-	-	10	9	10	10
LW3-ST004-01	2/27/2007	21	23	26	23	25	23	26
LW3-ST004-02	3/2/2007	11	12	12	12	10	12	12
LW3-ST004-03	3/5/2007	17	16	17	18	16	18	17
LW3-ST005-01	2/23/2007	9	9	9	8	8	8	9
LW3-ST005-02	2/26/2007	15	14	15	14	13	14	15
LW3-ST005-03	2/28/2007	8	9	8	8	8	8	8

ID – identification

^a ODFW staff.

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																						Stomach Content Concentration													
	STWB01 (RM 2.3)					STWB02 (RM 3.3)					STWB03 (RM 6.6)					STWB04 (RM 7.2)					STWB05 (RM 9.5)															
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																		
Metals (mg/kg)																																				
Aluminum	1	J	1.64	J	0.81	J	1.24	J	0.83	J	1.25	J	1.98	J	51.8	J	0.99	J	2.94	JT	4.05	J	0.95	J	0.76	J	0.92	J	0.78	J	319	J	3740	J	75.9	JT
Antimony	0.005	U	0.005	U	0.006	U	0.006	U	0.005	U	0.005	U	0.006	U	0.006	U	0.006	U	0.005	UT	0.005	U	0.006	U	0.005	U	0.006	U	0.003	U	0.004	U	0.004	UT		
Arsenic	0.54		0.35		0.85		0.73		0.67		0.48		0.49		0.48		1.06		0.298	T	0.58		0.69		0.46		0.56		0.67		0.35		0.82		0.17	T
Cadmium	0.01		0.005	J	0.011		0.006		0.006		0.006		0.005	J	0.014		0.004	J	0.019	T	0.007		0.007		0.003	J	0.007		0.004	J	0.037		0.054		0.008	T
Chromium	0.1	U	0.1	U	40.2		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	U	0.1	UT	0.1	U	0.1	U	0.2	U	0.5		4.1		0.15	JT				
Copper	0.939		0.685		0.959		0.926		0.827		0.644		0.821		0.7		0.721		0.909	T	0.744		0.697		0.544		0.935		0.816		11	J	6.73	J	7.8	JT
Lead	0.024		0.012		0.009		0.015		0.019		0.008		0.009		0.021		0.007		0.0135	T	0.011		0.02		0.009		0.012		0.017		0.139		1.5		0.103	T
Mercury	0.037	T	0.034		0.071		0.036		0.046		0.045		0.047		0.059		0.065		0.14	T	0.046		0.052		0.045		0.051		0.043		0.0073	J	0.0119	J	0.0115	J
Nickel	0.102	U	0.109	U	0.461		0.11	U	0.129	U	0.094	U	0.075	U	0.079	U	0.149	U	0.073	UT	0.093	U	0.08	U	0.061	U	0.125	U	0.065	U	0.267		2.33		0.631	T
Selenium	0.3		0.2	J	0.4		0.3		0.3		0.3		0.3		0.3		0.3	J	0.23	JT	0.3		0.4		0.2	J	0.3		0.2	J	0.1	UT				
Silver	0.002	J	0.001	J	0.002	J	0.003	J	0.002	J	0.002	J	0.002	J	0.002	U	0.004	JT	0.002	J	0.002	J	0.003	J	0.002	J	0.068	J	0.052	J	0.027	JT				
Zinc	9.88		10.1		7.79		11.9		10.9		9.33		8.44		9.61		11.7		8.17	T	7.39		9.79		10.6		8.65		8.66		19.1		18.8		9.56	T
Butyltins (µg/kg)																																				
Butyltin ion	0.25	U	0.11	U	0.11	U	0.11	U	0.55	U	0.55	U	0.11	U	0.11	U	0.98	U	0.11	UT	0.55	U	0.55	U	0.39	U	0.11	U								
Dibutyltin ion	0.17	U	0.17	U	0.17	U	0.17	U	0.85	U	0.85	U	0.17	U	0.17	U	0.17	U	0.17	UT	0.85	U	0.85	U	0.17	U	0.17	U								
Tetrabutyltin	0.43	U	0.43	U	0.43	U	0.43	U	2.2	U	2.2	U	0.43	U	0.43	U	0.43	U	0.43	UT	2.2	U	2.2	U	0.43	U	0.43	U								
Tributyltin ion	0.35	U	0.35	U	0.61	J	0.35	U	1.8	U	1.8	U	0.35	U	0.35	U	0.69	J	0.35	UT	1.8	U	1.8	U	0.7	J	1.1									
PAHs (µg/kg)																																				
2-Methylnaphthalene	1.1		1.4		1.7		0.87	J	1.2		0.75	J	4.6		2.3		1.5		1.2	T	1.4		2		1.2		1.3		2.2		0.46	J	200		0.51	J
Acenaphthene	0.11	U	0.27	J	0.11	U	0.11	U	0.11	U	0.44	J	29		2.9		0.11	U	0.47	JT	0.9		0.11	U	0.39	J	0.11	U	0.11	U	0.26	J	480		0.66	
Acenaphthylene	0.069	U	0.069	U	0.069	U	1		0.069	U	0.069	U	0.58		0.45	J	0.069	U	0.39	JT	1.1		0.069	U	0.069	U	0.069	U	0.069	U	0.14	J	38		0.069	U
Anthracene	0.065	U	0.16	J	0.065	U	0.065	U	0.065	U	0.065	U	0.99		0.37	J	0.065	U	0.39	JT	0.85		0.065	U	0.065	U	0.65		1.2		0.36	J	230		0.27	J
Benzo(a)anthracene	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	0.066	UT	0.066	U	0.066	U	0.066	U	0.066	U	0.066	U	3.4		420		0.066	U
Benzo(a)pyrene	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	0.081	UT	0.081	U	0.081	U	0.081	U	0.081	U	0.081	U	2.2		210		0.081	U
Benzo(b)fluoranthene	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	UT	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Benzo(g,h,i)perylene	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.073	UT	0.073	U	0.073	U	0.073	U	0.073	U	0.073	U	0.74		240		0.073	U
Benzo(k)fluoranthene	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	UT	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	2.4		270		0.056	U
Chrysene	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	0.076	UT	0.076	U	0.076	U	0.076	U	0.076	U	0.076	U	5.6		580		0.076	U
Dibenzo(a,h)anthracene	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	0.059	UT	0.059	U	0.059	U	0.059	U	0.059	U	0.059	U	40		0.059	U		
Fluoranthene	0.09	U	0.82		0.09																															

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																		Stomach Content Concentration															
	STWB01 (RM 2.3)			STWB02 (RM 3.3)			STWB03 (RM 6.6)			STWB04 (RM 7.2)			STWB05 (RM 9.5)			STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)																
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																
Phthalates (µg/kg)																																		
Bis(2-ethylhexyl) phthalate	66	U	80	J	66	U	66	U	66	U	140	J	66	U	66	UT	300		67	J	66	U	66	U										
Butylbenzyl phthalate	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	UT	7.3	U	7.3	U	7.3	U	7.3	U										
Dibutyl phthalate	100	U	77	U	16	U	16	U	100	U	110	U	95	U	90	U	96	UT	130	U	130	U	16	U	240	U								
Diethyl phthalate	15	U	37	U	10	U	9.7	U	13	U	11	U	13	U	25	U	34	U	31	UT	14	U	31	U	11	U	12	U						
Dimethyl phthalate	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	UT	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U								
Di-n-octyl phthalate	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	UT	11	U	11	U	11	U	11	U								
SVOCs (µg/kg)																																		
1,2,4-Trichlorobenzene	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	UT	9.8	U	9.8	U	9.8	U	9.8	U								
1,2-Dichlorobenzene	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	UT	11	U	11	U	11	U	11	U								
1,3-Dichlorobenzene	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	UT	11	U	11	U	11	U	11	U								
1,4-Dichlorobenzene	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	UT	11	U	11	U	11	U	11	U								
Benzyl alcohol	70		52		65		70		60		48		54		61		67		75	JT	57		66		64		65							
Hexachlorobenzene	1.01		1.28		1.85		2.38		1.7		0.911		1.07		0.997		1.47		1.7	T	2.01		1.35		1.1	T	1.18							
Hexachlorobutadiene	0.0161	UJ	0.0395	UJ	0.0056	J	0.00708	J	0.00819	UJ	0.004	J	0.00695	J	0.00863	J	0.008	UJ	0.00577	JT	0.0136	UJ	0.00442	J	0.00489	UJT	0.005	UJ	0.00477	UJ	0.0151	UJ		
Hexachloroethane	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	U	20	UT	20	U	20	U	20	U	20	U	20	U	20	U				
N-Nitrosodiphenylamine	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	UT	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U				
Phenols (µg/kg)																																		
2-Methylphenol	8.2	U	8.2	U	8.2	U	8.2	U	8.2	U	8.2	U	8.2	U	8.2	U	8.2	UT	8.5	J	8.2	U	8.2	U	9.9	J	8.2	U						
4-Methylphenol	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	7.7	U	19	J	7.7	UT	7.7	U	7.7	U	8.3	J	13	J	7.7	U				
Pentachlorophenol	30	U	30	U	30	U	30	U	30	U	30	U	30	U	30	U	30	UT	30	U	30	U	30	U	30	U	30	U	30	U				
Phenol	71	U	82	U	62	U	45	U	72	U	54	U	62	U	88	U	170	U	47	UJT	160	U	110	U	120	U	160	U	170	U				
PCB Congeners (pg/g)																																		
PCB TEQ – birds	1.3		1.04		2.15		2.6		1.6		0.67		1.2		1.4		1.3		2.33		2		1.6		1.35		1.2		2.5			0.42		
PCB TEQ – fish	0.027		0.0334		0.0437		0.045		0.034		0.019		0.022		0.032		0.028		0.0836		0.035		0.029		0.0305		0.033		0.042			0.007		
PCB TEQ – mammals	0.85		1.03		1.32		1.3		1		0.66		0.72		1.3		0.83		3.2		1		0.94		0.922		1.1		1.2			0.19		
PCB TEQ – mammals 2006	0.24		0.275		0.397		0.38		0.3		0.18		0.22		0.3		0.23		0.862															

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																				Stomach Content Concentration														
	STWB01 (RM 2.3)				STWB02 (RM 3.3)				STWB03 (RM 6.6)				STWB04 (RM 7.2)				STWB05 (RM 9.5)				STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)												
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																	
PCB 015	0.807	U	1.04	U	3.92		1.74	U	1.8		1.27	U	1.41	U	1.14	U	1.45	U	0.98	UT	1.93	U	1.21	UJ	0.626	UT	0.662	U	4.65	J				3.08	
PCB 016	1.78		1.34		4.26		1.46		2.51		1.25		2.59		1.73		2.44		1.19	T	1.31		1.48	J	0.875	UT	0.562	U	40.9	J				0.516	U
PCB 017	5.77		4.58		17.2		3.37		6.16		2.89		11.7		3.59		9.45		5.17	T	7.37		7.2	J	4.12	T	1.63		138	J				1.29	
PCB 018 & 030	48.1		49.9		128		42.9		76.9		33.2		55.7		44.3		72.7		61	T	98		56.1	J	40.7	T	22.1		210	J				2.65	U
PCB 019	13.5		8.49		63.2		18.9		13		11.1		30.9		9.58		12.3		38.2	T	23.3		27.3	J	12.1	T	12		66.8	J				1.13	
PCB 020 & 028	338		631		1030		991		753		424		433		474		780		1340	T	906		588	J	537	T	639		1040	J				44.3	
PCB 021 & 033	13.2		12.9		33.2		22.5		0.548	U	0.506	U	13		7.49		17.8		0.49	UT	0.456	U	0.534	UJ	6.62	T	0.553	U	152	J				2.35	U
PCB 022	23.4		18.9		55.2		16.6		21.3		10.6		26.3		15.6		39.1		27.8	T	34		29.4	J	19.5	T	7.2		122	J				1.92	
PCB 023	0.328	U	0.321	U	0.325	U	0.333	U	0.336	U	0.311	U	0.336	U	0.324	U	0.328	U	0.301	UT	0.28	U	0.328	UJ	0.327	UT	0.34	U	0.546	UJ				0.314	U
PCB 024	0.207	U	0.202	U	0.488		0.169	U	0.212	U	0.125	J	0.211	U	0.204	U	0.206	U	0.189	UT	0.176	U	0.207	UJ	0.206	UT	0.214	U	2.52	J				0.198	U
PCB 025	5.62		8.98		16.5		10.9		8.14		4.34		7.05		5.98		8.83		11.8	T	13.1		8.48	J	7.31	T	7.46		37.7	J				0.546	U
PCB 026 & 029	11.6		7.62		22.5		4.02		11.5		3.82		14.2		6.27		32.4		11	T	16.9		12.1	J	9.92	T	2.48		125	J				1.62	
PCB 027	9.52		8.05		18.5		6.06		9.63		4.65		13.4		4.72		15.4		13.1	T	12.6		10.9	J	9.71	T	3.91		42.5	J				0.54	
PCB 031	154		175		499		379		318		159		197		213		318		443	T	418		243	J	255	T	251		526	J				10.7	
PCB 032	17.6		27.1		76.8		29.1		34.1		18.5		30.2		20.4		37.1		50.6	T	50.8		32.6	J	24.4	T	18.1		99.5	J				4.4	
PCB 034	1.82		3.07		5.15		3.26		3.3		0.979		2.21		3.09		2.96		2.4	T	4.73		3.06	J	2.3	T	1.69		9.54	J				0.121	U
PCB 035	0.535	U	0.522	U	0.53	U	0.543	U	0.548	U	0.506	U	0.293	U	0.528	U	0.534	U	0.49	UT	0.456	U	0.534	UJ	0.533	UT	0.553	U	0.553	UJ				0.101	U
PCB 036	0.462	U	0.451	U	0.458	U	0.469	U	0.474	U	0.437	U	0.473	U	0.456	U	0.461	U	0.423	UT	0.394	U	0.462	UJ	0.46	UT	0.478	U	0.478	UJ				0.442	U
PCB 037	1.95		1.95		10.5		5.35		16.5		2.79		6.62		2.91		3.92		9.27	T	5.98		3.49		2.36	T	1.91		5.28					5.91	
PCB 038	1.65	U	0.356	U	0.362	U	0.371	U	0.926		0.345	U	0.373	U	0.36	U	0.364	U	0.334	UT	0.311	U	0.364	UJ	0.363	UT	0.377	U	5.94	J				0.349	U
PCB 039	1.96		1.36		3.27		2.48	U	1.74		0.431	J	1.44		1.73		1.98		0.575	T	3.25	U	1.77	J	1.4	T	1.14		0.465	UJ				0.115	U
PCB 040 & 041 & 071	140		121		259		120		195		34.5		165		115		153		104	T	229		151		164	T	64.9		1100					12.6	
PCB 042	72.8		51.8		93.9		37.4</td																												

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																			Stomach Content Concentration															
	STWB01 (RM 2.3)			STWB02 (RM 3.3)			STWB03 (RM 6.6)			STWB04 (RM 7.2)			STWB05 (RM 9.5)			STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)																	
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																	
PCB 066	1260		2080		2590		2900		2140		1050		1260		1410		1470		3160	T	2440		1670		1860	T	1840		3030					131	
PCB 067	3.98	NJ	3.93	NJ	6.61		5.13		0.496	U	1.06	U	4.08		2.5		2.79		9.02	JT	5.32		4.99		2.08	T	2.36		14				0.792		
PCB 068	36.6		44.5		71.8		82.6		49.9		28.9		24.7		43.5		46.7		93.4	T	85.4		64.5		36.4	T	38		80.6				2.85		
PCB 072	17.7		36.8		56.5		54.4		44.1		18.4		22.8		36.6		38.2		51.6	T	48		31.6		31.5	T	34.2		63.6				1.41		
PCB 073	0.365	U	15.8		21		18		0.374	U	9.06		10.4		7.47		14.7		28.7	T	18.3		16		15.2	T	13.5		22.5				1.25		
PCB 077	18.5		12.4		31.8		39.3		21.6		6.45		16.2		16.9		18.1		23	T	30.4		23		18.2	T	14.8		37.7				6.35		
PCB 078	0.503	U	0.402	U	0.44	U	0.541	U	0.592	U	0.506	U	0.41	U	0.396	U	0.554	U	0.523	UT	0.473	U	0.49	U	0.404	UT	0.463	U	0.415	U		0.384	U		
PCB 079	17.6		20.7		27		17.8		11.7		4.24		18.3		15.3		23.6		16.1	T	19.4		23.7		18.9	T	6.83		71.4				0.713	U	
PCB 080	0.444	U	0.355	U	0.388	U	0.476	U	0.512	U	0.444	U	0.323	U	0.341	U	0.487	U	0.46	UT	0.416	U	0.43	U	0.841	T	0.399	U	1.36				0.303	U	
PCB 081	0.407	U	0.327	U	0.349	U	2.9	U	1.97	U	1.55	U	1.74	U	1.7	U	1.91	U	2.95	UT	1.6	U	1.47	U	1.61	UT	1.38	U	2.68	U			0.387	U	
PCB 082	32.4		18.3		40.5		25.2		12.6		6.14		37.2		16.1		35.5		19.1	T	16		37.4		34.2	T	8		358				1.39	U	
PCB 083 & 099	3340		4420		5300		5090		4900		3200		3030		3690		3900		11100	T	4330		3700		3860	T	4620		5000				358		
PCB 084	253		283		418		376		446		166		273		258		255		358	T	377		258		317	T	274		810				8.98		
PCB 085 & 116 & 117	1090		1300		1620		1550		1350		952		887		998		888		2650	T	1300		1020		1220	T	1290		1490				85.4		
PCB 086 & 087 & 097 & 108 & 119 & 125	1200		1300		1650		1370		1610		783		1160		973		1660		2450	T	1520		1460		1630	T	1070		3120				71.2		
PCB 088 & 091	510		688		819		992		1050		537		516		588		559		995	T	847		557		759	T	749		1090				19.8		
PCB 089	6.62		3.57		7.25		3.88		5.57		0.74		6.75		4.27		2.39		2	T	6.14		5.33		4.79	T	1.54		34.6				0.279	U	
PCB 090 & 101 & 113	3670		4280		5280		4680		5660		3070		3360		3090		4640		10100	T	4720		4120		4880	T	4210		7330				185		
PCB 092	989		1190		1580		1440		1460		949		854		972		1140		2640	T	1280		1120		1170	T	1220		1490				48.3		
PCB 093 & 095 & 098 & 100 & 102	2050		2780		3300		3710		3770		1970		1960		2240		2100		4760	T	3150		2170		2660	T	2750		3860				120		
PCB 094	15.8		38.2		51		47.4		49		23.1		28.5		20.4		20.4		39.5	T	44.7		42.2		34.8	T	25.1		54.5				1.17		
PCB 096	8.36		8.76		11.7		22.3		11.2		3.42		11.2		12.3		4.62		11.4	T	13.3		7.45		6.91	T	14		20.5				0.486		
PCB 103	46.2		70.9		80.5		92.1		95.4		52.1		49		57.8		67.8		177	T	79.8		66.7		70.3	T	74.6		100				3.17		
PCB 104	2.03</																																		

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																		Stomach Content Concentration																
	STWB01 (RM 2.3)			STWB02 (RM 3.3)			STWB03 (RM 6.6)			STWB04 (RM 7.2)			STWB05 (RM 9.5)			STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)																	
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																	
PCB 129 & 138 & 160 & 163	9110		10700		11500		11500		10400		7440		8180		10200		8380		35200	T	9200		11600		8950	T	10600		10100					1190	
PCB 130	599		685		798		753		666		456		478		669		563		1490	T	619		629		568	T	602		673				37.6		
PCB 131	33.3		32.5		40.1		32.5		36.8		16.6		25.6		20.9		27.2		47.4	T	30.4		24.2		33.9	T	24.7		60.8				0.886		
PCB 132	1340		1240		1860		1650		1920		877		1250		1070		1300		2410	T	1560		1420		1610	T	1320		2280				47.4		
PCB 133	230		271		302		283		262		183		212		254		230		774	T	243		294		222	T	246		261				32.3		
PCB 134 & 143	171		196		225		192		0.461	U	85.7		184		136		196		281	JT	197		194		214	T	133		361				6.7		
PCB 135 & 151 & 154	2780		3300		3820		3710		3260		2050		2570		2390		2410		7730	T	3040		3350		2640	T	2720		3300				161		
PCB 136	381		445		513		617		513		252		372		382		267		731	T	492		319		368	T	443		570				18.2		
PCB 137	354		331		471		458		370		273		297		746		341		1550	T	383		373		342	T	439		389				52.7		
PCB 139 & 140	159		186		216		206		177		113		125		219		125		375	T	160		145		151	T	182		188				11.5		
PCB 141	1030		850		1490		1080		1270		821		910		1290		946		4200	T	1060		1500		1020	T	1110		1220				75.3		
PCB 142	1.26	U	0.938	U	1.19	U	0.894	U	0.46	U	0.824	U	0.907	U	1.14	U	1.11	U	0.823	UT	0.871	U	1.33	U	0.592	UT	0.622	U	1.17		0.299	U			
PCB 144	214		247		283		285		252		160		188		205		225		710	T	239		241		217	T	212		255				11		
PCB 145	1.24		1.18		1.02		1.84		1.7		0.735		1.01		1.13		0.638		1.12	T	1.5		1.01		1.28	T	1.17		1.97				0.186	U	
PCB 146	2010		2330		2620		2430		2220		1620		1830		2320		1990		8050	T	2080		2730		1880	T	2110		2200				287		
PCB 147 & 149	5720		6490		7130		7540		7530		4460		4980		5020		4950		13800	T	6330		6270		6370	T	6180		7360				288		
PCB 148	33		42.8		48.6		48.5		36.8		26.4		35		35.6		37.7		90.6	T	41.7		51.3		32.7	T	36.5		43.1				4.27		
PCB 150	18.5		24.3		22.3		31.2		26.6		14.5		15.1		18.6		16.6		35	T	26.1		15.2		20.1	T	23.6		31				0.712		
PCB 152	6.55		8.72		8.52		11.1		0.125	U	4.32		7.33		5.71		3.91		13.3	T	8.62		6.79		7.33	T	7.37		9.9				0.489		
PCB 153 & 168	9060		11600		11800		11300		10400		7920		8780		12900		9280		45100	T	9300		13100		9050	T	11100		10200				1450		
PCB 155	6.91		7.88		7.81		8.62		8		5.95		6.1		5.74		7.06		20.2	T	7.75		7.06		7.46	T	8.06		8.72				0.768		
PCB 156 & 157	728		777		1030		908		807		614		651		1630		659		3360	T	797		852		737	T	956		874				138		
PCB 158	749		869		1000		943		788		594		658		1150		687		2760	T	764		965		732	T	864		830				88.6		
PCB 159	58		46.1		77.4		68.5		61		45.1		61.6		55		49.2		226	T	62.5		89.9		59.2	T	64.7		71.5				5.85		
PCB 161	0.87	U	0.649	U	0.822	U	0.594																												

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																		Stomach Content Concentration															
	STWB01 (RM 2.3)			STWB02 (RM 3.3)			STWB03 (RM 6.6)			STWB04 (RM 7.2)			STWB05 (RM 9.5)			STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)																
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)																
PCB 182	13.7		12.1		17.8		16.6		14.7		11.3		14.4		19.6		17	T	13.8		25.2		12.3	T	15.4		14				2.8			
PCB 183 & 185	1110		1360		1550		1490		1300		1030		1450		1490		1320	T	1230		2520		1090	T	1300		1270				255			
PCB 184	8.18		8.77		7.69		9.06		6.98		5.62		5.84		6.88		6.44	T	7.73		5.89		7.46	T	7.21		8.58				0.5	U		
PCB 186	0.122	U	0.129	U	0.142	U	0.124	U	0.163	U	0.115	U	0.124	U	0.12	U	0.196	U	0.18	UT	0.156	U	0.125	U	0.121	UT	0.126	U	0.132	U	0.116	U		
PCB 187	3290		3900		4160		3750		3910		2720		3610		3240		3100		22700	T	3060		6230		3200	T	3540		3640				782	
PCB 188	9.28		11.2		12.4		12.3		11		8.25		9.94		9.83		10.6		40.3	T	10.3		15.1		9.11	T	10.6		11.3				2.15	
PCB 189	42		36.3		60.4		46.6		46.2		35.8		50.7		87.3		40.7		329	T	47.1		88.4		37.7	T	50.9		47.7				16.2	
PCB 190	320		349		434		436		422		327		377		452		329		2150	T	389		665		332	T	397		413				62.4	
PCB 191	40.3		45.3		57.3		57.7		52.9		41.8		64.6		72.9		57.6		432	T	50		125		41.8	T	52.6		52.2				18.1	
PCB 192	0.243	U	0.237	U	0.241	U	0.247	U	0.249	U	0.23	U	0.249	U	0.24	U	0.243	U	0.242	UT	0.207	U	0.243	U	0.242	UT	0.252	U	0.252	U	0.233	U		
PCB 194	377		312		612		518		473		448		774		777		569		5040	T	524		1420		419	T	596		457				160	
PCB 195	192		217		299		278		226		199		301		279		232		1820	T	249		539		207	T	280		241				72.5	
PCB 196	195		192		318		283		202		197		355		289		308		2550	T	234		694		180	T	272		239				99.9	
PCB 197 & 200	92.7		90.3		124		120		95.8		78.2		108		109		93.3		432	T	103		171		87.6	T	106		115				13	
PCB 198 & 199	644		567		979		803		700		626		971		929		845		6180	T	716		1790		591	T	830		728				195	
PCB 201	110		145		155		143		110		98.9		132		136		127		688	T	115		198		97.1	T	117		115				27.3	
PCB 202	300		383		379		408		303		280		351		359		319		1240	T	326		486		309	T	363		322				48.2	
PCB 203	405		459		632		580		389		432		633		616		558		3130	T	485		1130		362	T	510		451				99.4	
PCB 204	0.789		0.696		0.943		0.841		0.462	U	0.552		0.686		0.857		0.824		1.83	T	0.734		1.04		0.704	T	0.804		0.677				0.132	U
PCB 205	21.2		28.6		35.1		31.5		24.7		23.3		35.2		38.4		31.1		186	T	26.7		66		21.7	T	30.9		24.3				4.9	
PCB 206	145		147		261		210		161		193		255		297		262		1150	T	192		461		148	T	262		162				32.9	
PCB 207	29.6		29.4		44.1		40.3		29		32.3		41.2		42.4		45.3		229	T	34.5		72.7		30.3	T	42.4		32.7				8.43	
PCB 208	83.6		82.8		132		106		84		90.4		113		135		125		486	T	93.3		218		80.5	T	124		84.1				15.5	
PCB 209	83.7		79.4		153		111		86.8		101		140		153		132		295	T	95.2		299		82.9	T	149		82.9				21.9	
Total PCB Congeners	81700	NJ	97500	NJ	119000																													

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																						Stomach Content Concentration							
	STWB01 (RM 2.3)					STWB02 (RM 3.3)					STWB03 (RM 6.6)					STWB04 (RM 7.2)					STWB05 (RM 9.5)									
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)												
Hexachlorodibenzo- <i>p</i> -dioxin																														
1,2,3,7,8-Pentachlorodibenzofuran	0.467	J	0.364	J	0.462	J	0.68	J	0.461	J	0.299	J	0.453	J	0.362	J	0.194	J	0.906	JT	0.473	J	0.413	J	0.332	JT	0.333	J	0.513	J
1,2,3,7,8-Pentachlorodibenzo- <i>p</i> -dioxin	0.189	U	0.109	U	0.154	J	0.248	J	0.091	J	0.117	J	0.105	U	0.137	J	0.067	U	0.201	JT	0.197	U	0.188	J	0.107	JT	0.097	J	0.145	U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.085	U	0.105	U	0.106	U	0.062	U	0.107	U	0.0993	U	0.055	U	0.101	U	0.106	U	0.043	JT	0.106	U	0.108	U	0.059	JT	0.0977	U	0.062	U
2,3,4,7,8-Pentachlorodibenzofuran	0.293	U	0.249	J	0.365	J	0.545	J	0.294	J	0.176	J	0.264	J	0.305	J	0.195	U	0.458	JT	0.393	J	0.341	J	0.25	JT	0.282	J	0.395	J
2,3,7,8-Tetrachlorodibenzofuran	4.12		4.79		5.44		8.17		6.48		3.52		3.31		4.08		3.19		4.29	T	5.93		3.95		5.62	T	4.38		6.01	
2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin	0.189	U	0.196	U	0.291		0.356	U	0.237	J	0.119	U	0.203	U	0.178	U	0.171	U	0.21	JT	0.277		0.246	J	0.173	JT	0.234	U	0.271	J
Total dioxin/furan	6.97	J	7.49	J	9.64	J	13.5	J	10.2	J	6.32	J	6.51	J	7.57	J	4.91	J	8.8	J	10.4	J	7.72	J	8.14	J	7.69	J	11.7	J
Dioxin TEQ – birds	4.5		5.3		6.4		9.3		7.2		3.9		3.8		4.7		3.5		5.34		6.8		4.8		6.2		5		6.9	
Dioxin TEQ – fish	0.56		0.57		1		1.2		0.92		0.5		0.52		0.68		0.38		1		0.97		0.91		0.75		0.67		0.96	
Dioxin TEQ – mammals	0.78		0.83		1.3		1.7		1.2		0.69		0.69		0.89		0.54		1.24		1.3		1.1		1		0.89		1.3	
Dioxin TEQ – mammals 2006	0.74		0.77		1.2		1.5		1.2		0.65		0.63		0.82		0.52		1.13		1.2		1		0.97		0.82		1.2	
Total TEQ – birds	5.8		6.3		8.5		12		8.8		4.6		5		6.1		4.8		7.67		8.8		6.4		7.6		6.2		9.3	
Total TEQ – fish	0.58		0.61		1.1		1.3		0.95		0.52		0.54		0.71		0.4		1.09		1		0.94		0.78		0.71		1	
Total TEQ – mammals	1.6		1.9		2.6		2.9		2.3		1.3		1.4		2.2		1.4		4.45		2.3		2		1.9		2		2.4	
Total TEQ – mammals 2006	0.99		1		1.6		1.9		1.5		0.82		0.85		1.1		0.75		1.99		1.5		1.3		1.2		1.1		1.5	
Dioxin and Furan Homologs (pg/g)																														
Heptachlorodibenzofuran homologs	0.067		0.137		0.236		0.062		0.226		0.137	U	0.142	U	0.182		0.069		0.137	T	0.275		0.149	U	0.12	T	0.134	U	0.197	
Heptachlorodibenzo- <i>p</i> -dioxin homologs	0.526		0.418		0.708		0.795		0.51		0.499		0.592		0.641		0.237	U	0.539	T	0.72		0.653		0.31	T	0.636		1.17	
Hexachlorodibenzofuran homologs	0.225		0.27		0.644		0.698		0.531		0.235		0.298		0.525		0.117		0.773	T	0.838		0.204		0.124	T	0.344		0.74	
Hexachlorodibenzo- <i>p</i> -dioxin homologs	0.319		0.211		0.192		0.755		0.24		0.191		0.07		0.401		0.125		0.417	T	0.538		0.194		0.073	T	0.452		0.623	
Octachlorodibenzofuran	0.278	U	0.116	U	0.21	U	0.227	U	0.144	U	0.301	U	0.144	U	0.166	U	0.118	U	0.141	UT	0.173	U	0.313	U	0.108	UT	0.151	U	0.191	U
Octachlorodibenzo- <i>p</i> -dioxin	0.908	U	0.779	J	1.14	J	1.46	J	1.11	J	0.909	J	1.05	J	0.944	J	0.579	J	0.78	JT	1.2	J	1.01	J	0.719	JT	1.02	J	2.1	J
Pentachlorodibenzofuran homologs	0.519		0.683		1.02		1.45		0.855		0.475		0.717		0.666		0.194		1.46	T	1.16		0.825		0.655	T	0.726		1.04	
Pentachlorodibenzo- <i>p</i> -dioxin homologs	0.15	U	0.147	U	0.154		0.248		0.091		0.117		0.145	U	0.137		0.149	U	0.201	T	0.148	U	0.188		0.107	T	0.097		0.15	U
Tetrachlorodibenzofuran homologs	4.49		5.05		6.19		8.43		6.57		3.79		3.67		4.14		3.24		4.54	T	5.92		3.88		5.97	T	4.93		6.39	
Tetrachlorodibenzo- <i>p</i> -dioxin homologs	0.0498	U	0.0485	U	0.291		0.0492	U	0.237		0.0459	U	0.048	U	0.0467	U	0.0494	U	0.21	T	0.277		0.246		0.173	T	0.0457	U	0.271	
Pesticides (µg/kg)																														
2,4'-DDD	1.53		2.36		3.44		4.53		4.05		1.6		1.69		1.51		1.68		1.7	T	3.28		1.97		3.44	T	1.88		4.43	
2,4'-DDE	0.24		0.488	J	0.796		0.929		0.781		0.341		0.392		0.209		0.21	J	0.173	JT	0.904		0.408		0.762	T	0.208	J	0.957	

Table 4-4. Analytical Results for Sturgeon Whole-Body Tissue and Stomach Content Samples

Chemical	Whole-Body Tissue Concentration																		Stomach Content Concentration			
	STWB01 (RM 2.3)			STWB02 (RM 3.3)			STWB03 (RM 6.6)			STWB04 (RM 7.2)			STWB05 (RM 9.5)			STWB01 (RM 2.3)	STWB03 (RM 6.6)	STWB04 (RM 7.2)				
	LW3-STWB001-01 (2/21/2007)	LW3-STWB001-02 (3/6/2007)	LW3-STWB001-03 (3/6/2007)	LW3-STWB002-01 (2/21/2007)	LW3-STWB002-02 (2/22/2007)	LW3-STWB002-03 (2/26/2007)	LW3-STWB003-01 (2/22/2007)	LW3-STWB003-02 (2/22/2007)	LW3-STWB003-03 (3/6/2007)	LW3-STWB004-01 (2/27/2007)	LW3-STWB004-02 (3/2/2007)	LW3-STWB004-03 (3/5/2007)	LW3-STWB005-01 (2/23/2007)	LW3-STWB005-02 (2/26/2007)	LW3-STWB005-03 (2/28/2007)	LW3-SG001005-COMP (3/6/2007)	LW3-SG003-01 (2/22/2007)	LW3-SG004-01 (2/27/2007)				
																					6	
2,4'-DDT	0.653		2.06		2.87		2.4		2.68		1.31		1.41		0.73		0.768		0.957	T	2.8	
4,4'-DDD	9.2		19.1		22.5		24.9		22.1		10.8		12.1		10.7		13.5		12	T	20.9	
4,4'-DDE	88.5		96.9		108		111		90.4		69.8		59.1		67.8		78.3		156	T	96.5	
4,4'-DDT	2.61		3.76		6.06		6.01		7.49		2.9		3.16		3.19		3.1		5.39	T	5.61	
Aldrin	0.0125	J	0.032	J	0.0554	J	0.0389	U	0.0266	J	0.0184	J	0.0273	J	0.0103	J	0.017	J	0.0301	JT	0.0428	J
alpha-Endosulfan	0.171	J	0.319	J	0.619		0.663		0.515		0.148	J	0.216	J	0.153	J	0.196	J	0.108	JT	0.803	
alpha-Hexachlorocyclohexane	0.0204	J	0.013	J	0.0402	J	0.0505	J	0.0292	J	0.015	J	0.018	J	0.0208	J	0.041	J	0.0176	JT	0.0329	J
beta-Endosulfan	0.168	U	0.198	J	0.297	J	0.202	J	0.279		0.173	J	0.214	J	0.154	J	0.197	J	0.173	JT	0.368	J
beta-Hexachlorocyclohexane	0.00854	U	0.009	U	0.0219	J	0.0281	U	0.0104	UJ	0.00765	U	0.0106	U	0.00766	U	0.025	J	0.00592	JT	0.0143	U
cis-Chlordane	1.51		2.76		3.23		3.39		3.02		1.85		1.65		1.45		2.31		4.81	T	3.37	
cis-Nonachlor	1.23		1.56		1.83		1.85		1.55		1.01		1		1.07		1.32		3.43	T	1.64	
delta-Hexachlorocyclohexane	0.0587	U	0.0592	U	0.0595	U	0.0588	U	0.0237	U	0.0596	U	0.0591	U	0.0596	U	0.0589	U	0.0463	UT	0.0586	U
Dieldrin	1.28		1.82		2.45		2.42		2.36		1.24		1.45		1.29		2.11		1.89	T	3.11	
Endosulfan sulfate	1.38		0.966		1.67		1.82		0.856		0.747		1.17		1.02		1.81		0.918	T	2.23	
Endrin	0.0526	J	0.0411	J	0.0763	J	0.107	J	0.073	J	0.0291	U	0.0377	J	0.0527	J	0.0819	J	0.0314	JT	0.0917	J
Endrin aldehyde	0.0332	U	0.0839	U	0.0843	U	0.0333	U	0.009	UJ	0.0845	U	0.0837	U	0.0844	U	0.0835	U	0.002	UT	0.083	U
Endrin ketone	0.0831	U	0.0839	U	0.0843	U	0.0112	J	0.008	J	0.0845	U	0.0837	U	0.0844	U	0.0835	U	0.0656	UT	0.012	J
gamma-Hexachlorocyclohexane	0.0248	J	0.017	U	0.0439	J	0.0618	J	0.0256	J	0.0123	J	0.0175	J	0.0495	J	0.049	J	0.017	JT	0.0335	J
Heptachlor	0.0262	U	0.0642	U	0.0259	U	0.0265	U	0.0033	J	0.0247	U	0.0271	U	0.0259	U	0.0639	U	0.00344	UT	0.00688	U
Heptachlor epoxide	0.235	J	0.248	J	0.354	J	0.5		0.356		0.16	J	0.202	J	0.237	J	0.359	J	0.222	JT	0.486	
Methoxychlor	0.0489	U	0.0494	U	0.0496	U	0.049	U	0.0198	U	0.0497	U	0.0493	U	0.0497	U	0.0491	U	0.0386	UT	0.0488	U
Oxychlordane	0.224	J	0.421	J	0.436		0.415		0.41		0.23	J	0.285	J	0.226	J	0.371	J	1.02	T	0.438	
Sum DDD	11		21.5		25.9		29.4		26.2		12		13.8		12.2		15.2		14		24.2	
Sum DDE	89		97.4	J	109		112		91.2		70.1		59.5		68		79	J	156	J	97.4	
Sum DDT	3.26		5.82		8.93		8.4		10.2		4.2		4.57		3.9		3.9		6.35		8.4	
Total chlordane	6.67	J	9.92	J	12		12.3		10		6.6	J	6.3	J	6.22	J	8.77	J	20		11.6	
Total DDTs	100		125	J	144		150		128		87		77.9		84		98	J	180	J	130	
Total endosulfan	1.64	J	1.48	J	2.59	J	2.69	J	1.65		1.07	J	1.6	J	1.33	J	2.2	J	1.2	J	3.4	J
trans-Chlordane	0.769		1.36		1.65		1.88		1.41		0.792		0.789		0.783		0.854	J	1.35	T	1.74	
trans-Nonachlor	2.94		3.82		4.81		4.81		3.96		2.74		2.59		2.69		3.91		9.8	T	4.46	
Conventionals (%)																						
Lipids	4.58		2.92		8.28		8.45		5.81		2.59		3.69		4.59		6.16		3.55	T	7.33	
Total solids	25.4		24.5		28.2		30.5	T	25.3		26		29.9		24.6		31.3		26.1	T	26.	

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations				
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL			
Sturgeon – Whole Body												
Metals (mg/kg)												
Aluminum	15	15	100	0.76	J	51.8	J	4.8	4.8			
Antimony	15	0	0	nd		nd		nd	0.0027			
Arsenic	15	15	100	0.298	T	1.06		0.59	0.59			
Cadmium	15	15	100	0.003	J	0.019	T	0.0076	0.0076			
Chromium	15	2	13	0.2	J	40.2		20	2.7			
Copper	15	15	100	0.544		0.959		0.79	0.79			
Lead	15	15	100	0.007		0.024		0.014	0.014			
Mercury	15	15	100	0.034		0.14	T	0.054	0.054			
Nickel	15	1	7	0.461		0.461		0.46	0.076			
Selenium	15	15	100	0.2	J	0.4		0.29	0.29			
Silver	15	13	87	0.001	J	0.004	JT	0.0022	0.0021			
Zinc	15	15	100	7.39		11.9		9.53	9.53			
Butyltins (µg/kg)												
Butyltin ion	15	0	0	nd		nd		nd	0.17			
Dibutyltin ion	15	0	0	nd		nd		nd	0.20			
Tetrabutyltin	15	0	0	nd		nd		nd	0.51			
Tributyltin ion	15	4	27	0.61	J	1.1		0.78	0.58			
PAHs (µg/kg)												
2-Methylnaphthalene	15	15	100	0.75	J	4.6		1.6	1.6			
Acenaphthene	15	7	47	0.27	J	29		4.9	2.3			
Acenaphthylene	15	5	33	0.39	JT	1.1		0.70	0.26			
Anthracene	15	7	47	0.16	J	1.2		0.66	0.32			
Benzo(a)anthracene	15	0	0	nd		nd		nd	0.033			
								0.066	0.066			
								0.066	0.066			

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations		
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL	
Benzo(a)pyrene	15	0	0	nd	nd	nd	0.041	0.081	U	0.081
Benzo(b)fluoranthene	15	0	0	nd	nd	nd	0.035	0.07	U	0.07
Benzo(g,h,i)perylene	15	0	0	nd	nd	nd	0.037	0.073	U	0.073
Benzo(k)fluoranthene	15	0	0	nd	nd	nd	0.028	0.056	U	0.056
Chrysene	15	0	0	nd	nd	nd	0.038	0.076	U	0.076
Dibenzo(a,h)anthracene	15	0	0	nd	nd	nd	0.030	0.059	U	0.059
Fluoranthene	15	2	13	0.79	0.82	0.81	0.15	0.09	U	0.09
Fluorene	15	3	20	0.22	J	5	1.8	0.43	0.15	U
Indeno(1,2,3-cd)pyrene	15	0	0	nd	nd	nd	0.032	0.064	U	0.064
Naphthalene	15	8	53	4.1	14	6.4	3.8	0.4	U	3.4
Phenanthrene	15	10	67	0.37	J	5.3	1.1	0.82	0.36	U
Pyrene	15	1	7	0.78	0.78	0.78	0.098	0.098	U	0.098
Total Benzofluoranthenes (calc'd)	15	0	0	nd	nd	nd	0.035	0.07	U	0.07
Total HPAHs (calc'd)	15	2	13	1.1	1.8	1.5	0.24	0.098	U	0.098
Total LPAHs (calc'd)	15	15	100	2.1	J	59	9.6	9.6	na	na
Total PAHs (calc'd)	15	15	100	2.5	J	61	10	10	na	na
Phthalates (µg/kg)										
Bis(2-ethylhexyl) phthalate	15	4	27	67	J	300	150	63	66	U
Butylbenzyl phthalate	15	0	0	nd	nd	nd	3.7	7.3	U	7.3
Dibutyl phthalate	15	0	0	nd	nd	nd	47	16	U	240
Diethyl phthalate	15	0	0	nd	nd	nd	9.3	9.7	U	37
Dimethyl phthalate	15	0	0	nd	nd	nd	3.9	7.7	U	7.7
Di-n-octyl phthalate	15	0	0	nd	nd	nd	5.5	11	U	11
SVOCs (µg/kg)										
1,2,4-Trichlorobenzene	15	0	0	nd	nd	nd	4.9	9.8	U	9.8
1,2-Dichlorobenzene	15	0	0	nd	nd	nd	5.5	11	U	11

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL		Maximum RL	
1,3-Dichlorobenzene	15	0	0	nd		nd		nd	5.5	11	U	11	U
1,4-Dichlorobenzene	15	0	0	nd		nd		nd	5.5	11	U	11	U
Benzyl alcohol	15	15	100	48		75	JT	62	62	na		na	
Hexachlorobenzene	15	15	100	0.911		2.38		1.5	1.5	na		na	
Hexachlorobutadiene	15	7	47	0.004	J	0.0086	J	0.0061	0.0062	0.00477	UJ	0.0395	UJ
Hexachloroethane	15	0	0	nd		nd		nd	10	20	U	20	U
n-Nitrosodiphenylamine	15	0	0	nd		nd		nd	3.3	6.6	U	6.6	U
Phenols (µg/kg)													
2-Methylphenol	15	2	13	8.5	J	9.9	J	9.2	4.8	8.2	U	8.2	U
4-Methylphenol	15	3	20	8.3	J	19	J	13	5.8	7.7	U	7.7	U
Pentachlorophenol	15	0	0	nd		nd		nd	15	30	U	30	U
Phenol	15	0	0	nd		nd		nd	49	45	U	170	U
PCB Congeners (pg/g)													
PCB TEQ – birds	15	15	100	0.666		2.6		1.61	1.61	na		na	
PCB TEQ – fish	15	15	100	0.019		0.0836		0.0358	0.0358	na		na	
PCB TEQ – mammals	15	15	100	0.656		3.2		1.15	1.15	na		na	
PCB TEQ – mammals 2006	15	15	100	0.175		0.862		0.320	0.320	na		na	
PCB 001	15	1	7	5.04	J	5.04	J	5.04	0.576	0.264	U	0.817	U
PCB 002	15	0	0	nd		nd		nd	0.134	0.127	U	0.954	UJ
PCB 003	15	2	13	0.5		1.01	J	0.755	0.311	0.28	U	0.678	U
PCB 004	15	15	100	2.11		63.9	J	10.8	10.8	na		na	
PCB 005	15	1	7	0.422	J	0.422	J	0.422	0.138	0.08	U	0.331	U
PCB 006	15	14	93	0.359	JT	10	J	1.54	1.45	0.289	U	0.289	U
PCB 007	15	10	67	0.112	J	1.6	J	0.317	0.252	0.131	UT	0.316	U
PCB 008	15	14	93	3.9		39	J	11.0	10.3	1.86	U	1.86	U
PCB 009	15	13	87	0.185	JT	2.46	J	0.561	0.508	0.314	U	0.338	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL		Maximum RL	
PCB 010	15	13	87	0.256	J	2.86	J	0.683	0.608	0.217	U	0.252	U
PCB 011	15	15	100	3.98		18.6		8.86	8.86	na		na	
PCB 012 & 013	15	13	87	0.174	J	1.24	J	0.536	0.488	0.352	U	0.363	U
PCB 014	15	0	0	nd		nd		nd	0.204	0.352	U	0.428	U
PCB 015	15	3	20	1.8		4.65	J	3.46	1.17	0.626	UT	1.93	U
PCB 016	15	13	87	1.19	T	40.9	J	4.94	4.33	0.562	U	0.875	UT
PCB 017	15	15	100	1.63		138	J	15.2	15.2	na		na	
PCB 018 & 030	15	15	100	22.1		210	J	69.3	69.3	na		na	
PCB 019	15	15	100	8.49		66.8	J	24.0	24.0	na		na	
PCB 020 & 028	15	15	100	338		1340	T	727	727	na		na	
PCB 021 & 033	15	9	60	6.62	T	152	J	31.0	18.7	0.456	U	0.553	U
PCB 022	15	15	100	7.2		122	J	31.1	31.1	na		na	
PCB 023	15	0	0	nd		nd		nd	0.169	0.28	U	0.546	UJ
PCB 024	15	3	20	0.125	J	2.52	J	1.04	0.289	0.169	U	0.214	U
PCB 025	15	15	100	4.34		37.7	J	10.8	10.8	na		na	
PCB 026 & 029	15	15	100	2.48		125	J	19.4	19.4	na		na	
PCB 027	15	15	100	3.91		42.5	J	12.2	12.2	na		na	
PCB 031	15	15	100	154		526	J	303	303	na		na	
PCB 032	15	15	100	17.6		99.5	J	37.8	37.8	na		na	
PCB 034	15	15	100	0.979		9.54	J	3.30	3.30	na		na	
PCB 035	15	0	0	nd		nd		nd	0.255	0.293	U	0.553	U
PCB 036	15	0	0	nd		nd		nd	0.228	0.394	U	0.478	U
PCB 037	15	15	100	1.91		16.5		5.39	5.39	na		na	
PCB 038	15	2	13	0.926		5.94	J	3.43	0.655	0.311	U	1.65	U
PCB 039	15	12	80	0.431	J	3.27		1.57	1.46	0.465	UJ	3.25	U
PCB 040 & 041 & 071	15	15	100	34.5		1100		208	208	na		na	

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations	
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
PCB 042	15	15	100	12.9	597	94.1	94.1	na	na
PCB 043	15	15	100	16.7	86.5	39.9	39.9	na	na
PCB 044 & 047 & 065	15	15	100	825	2970	1,570	1,570	na	na
PCB 045 & 051	15	15	100	48.6	263	117	117	na	na
PCB 046	15	15	100	2.69	37.8	9.69	9.69	na	na
PCB 048	15	15	100	7.65	360	48.0	48.0	na	na
PCB 049 & 069	15	15	100	693	2090	1,240	1,240	na	na
PCB 050 & 053	15	15	100	95.3	325	196	196	na	na
PCB 052	15	15	100	1280	3640	2,110	2,110	na	na
PCB 054	15	15	100	2.75	20.2	T	6.99	6.99	na
PCB 055	15	0	0	nd	nd	nd	0.242	0.439	U
PCB 056	15	14	93	4.99	295	48.1	45.0	0.829	U
PCB 057	15	15	100	1.32	10.4	4.38	4.38	na	na
PCB 058	15	14	93	1.54	14.2	6.25	5.85	0.495	UT
PCB 059 & 062 & 075	15	15	100	61.6	269	118	118	na	na
PCB 060	15	15	100	364	954	T	551	551	na
PCB 061 & 070 & 074 & 076	15	15	100	1150	3990	T	2,200	2,200	na
PCB 063	15	15	100	88	308	T	143	143	na
PCB 064	15	15	100	593	1550	909	909	na	na
PCB 066	15	15	100	1050	3160	T	2,010	2,010	na
PCB 067	15	13	87	2.08	T	14	5.14	4.50	0.496
PCB 068	15	15	100	24.7	93.4	T	55.2	55.2	na
PCB 072	15	15	100	17.7	63.6	39.1	39.1	na	na
PCB 073	15	13	87	7.47	28.7	T	16.2	14.1	0.365
PCB 077	15	15	100	6.45	39.3	21.9	21.9	na	na
PCB 078	15	0	0	nd	nd	nd	0.237	0.396	U
									0.592

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations	
				Minimum	Maximum	Mean Detected Value	Half RL	Minimum RL	Maximum RL
PCB 079	15	15	100	4.24	71.4	20.8	20.8	na	na
PCB 080	15	2	13	0.841	T	1.36	1.10	0.329	0.323 U 0.512 U
PCB 081	15	0	0	nd	nd	nd	0.818	0.327 U	2.95 UT
PCB 082	15	15	100	6.14	358	46.4	46.4	na	na
PCB 083 & 099	15	15	100	3030	11100	T 4,630	4,630	na	na
PCB 084	15	15	100	166	810	341	341	na	na
PCB 085 & 116 & 117	15	15	100	887	2650	T 1,310	1,310	na	na
PCB 086 & 087 & 097 & 108 & 119 & 125	15	15	100	783	3120	1,530	1,530	na	na
PCB 088 & 091	15	15	100	510	1090	750	750	na	na
PCB 089	15	15	100	0.74	34.6	6.36	6.36	na	na
PCB 090 & 101 & 113	15	15	100	3070	10100	T 4,870	4,870	na	na
PCB 092	15	15	100	854	2640	T 1,300	1,300	na	na
PCB 093 & 095 & 098 & 100 & 102	15	15	100	1960	4760	T 2,880	2,880	na	na
PCB 094	15	15	100	15.8	54.5	35.6	35.6	na	na
PCB 096	15	15	100	3.42	22.3	11.2	11.2	na	na
PCB 103	15	15	100	46.2	177	T 78.7	78.7	na	na
PCB 104	15	15	100	1.98	9.92	T 3.74	3.74	na	na
PCB 105	15	15	100	1390	4640	T 2,190	2,190	na	na
PCB 106	15	0	0	nd	nd	nd	0.239	0.326 U 0.642 UT	
PCB 107 & 124	15	15	100	8.88	40.2	T 23.7	23.7	na	na
PCB 109	15	15	100	369	1420	T 577	577	na	na
PCB 110 & 115	15	15	100	2770	8090	4,750	4,750	na	na
PCB 111	15	14	93	8.46	36.5	JT 13.1	12.2	0.264 U 0.264 U	
PCB 112	15	0	0	nd	nd	nd	0.230	0.173 U 2.81 U	
PCB 114	15	15	100	78.5	411	T 145	145	na	na
PCB 118	15	15	100	997	5910	T 2,470	2,470	na	na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	
PCB 120	15	14	93	14.3		69.5	JT	29.0	27.1	0.249	U
PCB 121	15	14	93	4.73		26.2	JT	8.54	7.98	0.264	U
PCB 122	15	1	7	3.58		3.58		3.58	0.498	0.363	UT
PCB 123	15	2	13	58.6		89.3	T	74.0	31.2	23.2	U
PCB 126	15	0	0	nd		nd		nd	0.665	0.665	U
PCB 127	15	0	0	nd		nd		nd	0.256	0.343	U
PCB 128 & 166	15	15	100	785		2570	T	1,170	1,170	na	na
PCB 129 & 138 & 160 & 163	15	15	100	7440		35200	T	11,500	11,500	na	na
PCB 130	15	15	100	456		1490	T	683	683	na	na
PCB 131	15	15	100	16.6		60.8		32.5	32.5	na	na
PCB 132	15	15	100	877		2410	T	1,540	1,540	na	na
PCB 133	15	15	100	183		774	T	284	284	na	na
PCB 134 & 143	15	14	93	85.7		361		198	184	0.461	U
PCB 135 & 151 & 154	15	15	100	2050		7730	T	3,270	3,270	na	na
PCB 136	15	15	100	252		731	T	444	444	na	na
PCB 137	15	15	100	273		1550	T	474	474	na	na
PCB 139 & 140	15	15	100	113		375	T	182	182	na	na
PCB 141	15	15	100	821		4200	T	1,320	1,320	na	na
PCB 142	15	1	7	1.17		1.17		1.17	0.510	0.46	U
PCB 144	15	15	100	160		710	T	262	262	na	na
PCB 145	15	15	100	0.638		1.97		1.24	1.24	na	na
PCB 146	15	15	100	1620		8050	T	2,560	2,560	na	na
PCB 147 & 149	15	15	100	4460		13800	T	6,680	6,680	na	na
PCB 148	15	15	100	26.4		90.6	T	42.7	42.7	na	na
PCB 150	15	15	100	14.5		35	T	22.6	22.6	na	na
PCB 152	15	14	93	3.91		13.3	T	7.82	7.30	0.125	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL		Maximum RL	
PCB 153 & 168	15	15	100	7920		45100	T	12,700	12,700	na		na	
PCB 155	15	15	100	5.74		20.2	T	8.22	8.22	na		na	
PCB 156 & 157	15	15	100	614		3360	T	1,030	1,030	na		na	
PCB 158	15	15	100	594		2760	T	957	957	na		na	
PCB 159	15	15	100	45.1		226	T	73.0	73.0	na		na	
PCB 161	15	0	0	nd		nd		nd	0.305	0.32	U	0.886	U
PCB 162	15	15	100	25.8		121	T	42.5	42.5	na		na	
PCB 164	15	15	100	343		1280	T	524	524	na		na	
PCB 165	15	15	100	8.81		46.4	T	15.1	15.1	na		na	
PCB 167	15	15	100	5.57		63.2	T	19.9	19.9	na		na	
PCB 169	15	0	0	nd		nd		nd	2.42	1.95	U	19.6	UT
PCB 170	15	15	100	952		8960	T	1,960	1,960	na		na	
PCB 171 & 173	15	15	100	412		2310	T	670	670	na		na	
PCB 172	15	15	100	207		1830	T	436	436	na		na	
PCB 174	15	15	100	880		4850	T	1,410	1,410	na		na	
PCB 175	15	15	100	56.2		400	T	99.3	99.3	na		na	
PCB 176	15	15	100	130		432	T	200	200	na		na	
PCB 177	15	15	100	1050		5140	T	1,590	1,590	na		na	
PCB 178	15	15	100	475		2620	T	762	762	na		na	
PCB 179	15	15	100	467		1630	T	825	825	na		na	
PCB 180 & 193	15	15	100	2860		33000	T	6,090	6,090	na		na	
PCB 181	15	15	100	15.2		91.2	T	25.0	25.0	na		na	
PCB 182	15	15	100	11.3		57.2	T	18.3	18.3	na		na	
PCB 183 & 185	15	15	100	1030		7630	T	1,810	1,810	na		na	
PCB 184	15	15	100	5.62		13.6	T	7.73	7.73	na		na	
PCB 186	15	0	0	nd		nd		nd	0.0692	0.115	U	0.196	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
PCB 187	15	15	100	2720		22700	T	4,940	4,940	na	na
PCB 188	15	15	100	8.25		40.3	T	12.8	12.8	na	na
PCB 189	15	15	100	35.8		329	T	69.8	69.8	na	na
PCB 190	15	15	100	320		2150	T	519	519	na	na
PCB 191	15	15	100	40.3		432	T	82.9	82.9	na	na
PCB 192	15	0	0	nd		nd		nd	0.121	0.207	U
PCB 194	15	15	100	312		5040	T	888	888	na	na
PCB 195	15	15	100	192		1820	T	371	371	na	na
PCB 196	15	15	100	180	T	2550	T	434	434	na	na
PCB 197 & 200	15	15	100	78.2		432	T	128	128	na	na
PCB 198 & 199	15	15	100	567		6180	T	1,190	1,190	na	na
PCB 201	15	15	100	97.1	T	688	T	166	166	na	na
PCB 202	15	15	100	280		1240	T	409	409	na	na
PCB 203	15	15	100	362	T	3130	T	718	718	na	na
PCB 204	15	14	93	0.552		1.83	T	0.856	0.814	0.462	U
PCB 205	15	15	100	21.2		186	T	41.6	41.6	na	na
PCB 206	15	15	100	145		1150	T	287	287	na	na
PCB 207	15	15	100	29		229	T	51.7	51.7	na	na
PCB 208	15	15	100	80.5	T	486	T	136	136	na	na
PCB 209	15	15	100	79.4		299		136	136	na	na
Total PCB congeners (calc'd)	15	15	100	69100	J	325000	NJ	114,000	114,000	na	na
Dioxins & Furans (pg/g)											
1,2,3,4,6,7,8-Heptachlorodibenzofuran	15	8	53	0.069	J	0.217	J	0.151	0.125	0.13	U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	15	14	93	0.31	JT	1.03	J	0.592	0.560	0.237	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL		Maximum RL	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	15	4	27	0.057	J	0.098	J	0.0710	0.0553	0.051	UT	0.125	U
1,2,3,4,7,8-Hexachlorodibenzofuran	15	11	73	0.051	J	0.5	JT	0.159	0.136	0.08	UT	0.206	U
1,2,3,4,7,8-Hexachlorodibenzo- <i>p</i> -dioxin	15	5	33	0.081	J	0.106	J	0.0958	0.0659	0.058	U	0.231	U
1,2,3,6,7,8-Hexachlorodibenzofuran	15	8	53	0.065	J	0.17	JT	0.119	0.0899	0.066	U	0.178	U
1,2,3,6,7,8-Hexachlorodibenzo- <i>p</i> -dioxin	15	11	73	0.125	J	0.573	J	0.320	0.272	0.186	UT	0.364	U
1,2,3,7,8,9-Hexachlorodibenzofuran	15	1	7	0.051	J	0.051	J	0.0510	0.0434	0.0761	UT	0.089	U
1,2,3,7,8,9-Hexachlorodibenzo- <i>p</i> -dioxin	15	8	53	0.07	J	0.182	J	0.0998	0.0779	0.07	U	0.164	U
1,2,3,7,8-Pentachlorodibenzofuran	15	15	100	0.194	J	0.906	JT	0.447	0.447	na		na	
1,2,3,7,8-Pentachlorodibenzo- <i>p</i> -dioxin	15	9	60	0.091	J	0.248	J	0.149	0.116	0.067	U	0.197	U
2,3,4,6,7,8-Hexachlorodibenzofuran	15	2	13	0.043	JT	0.059	JT	0.0510	0.0468	0.055	U	0.108	U
2,3,4,7,8-Pentachlorodibenzofuran	15	13	87	0.176	J	0.545	J	0.332	0.304	0.195	U	0.293	U
2,3,7,8-Tetrachlorodibenzofuran	15	15	100	3.19		8.17		4.89	4.89	na		na	
2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin	15	7	47	0.173	JT	0.291		0.244	0.169	0.119	U	0.356	U
Dioxin TEQ – birds	15	15	100	3.46		9.27		5.57	5.57	na		na	
Dioxin TEQ – fish	15	15	100	0.377		1.21		0.774	0.774	na		na	
Dioxin TEQ – mammals	15	15	100	0.541		1.67		1.03	1.03	na		na	
Dioxin TEQ – mammals 2006	15	15	100	0.518		1.55		0.960	0.960	na		na	
Total dioxin/furans (calc'd)	15	15	100	4.91	J	13.5	J	8.50	8.50	na		na	
Total TEQ – birds	15	15	100	4.6		11.9		7.18	7.18	na		na	
Total TEQ – fish	15	15	100	0.405		1.26		0.810	0.810	na		na	
Total TEQ – mammals	15	15	100	1.34		4.45		2.18	2.18	na		na	
Total TEQ – mammals 2006	15	15	100	0.752		1.99		1.28	1.28	na		na	

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL		Maximum RL	
Dioxin and Furan Homologs (pg/g)													
Heptachlorodibenzofuran homologs	15	11	73	0.062		0.275		0.155	0.133	0.134	U	0.149	U
Heptachlorodibenzo-p-dioxin homologs	15	14	93	0.31	T	1.17		0.623	0.589	0.237	U	0.237	U
Hexachlorodibenzofuran homologs	15	15	100	0.117		0.838		0.438	0.438	na		na	
Hexachlorodibenzo-p-dioxin homologs	15	15	100	0.07		0.755		0.320	0.320	na		na	
Octachlorodibenzofuran	15	0	0	nd		nd		nd	0.0927	0.108	UT	0.313	U
Octachlorodibenzo-p-dioxin	15	14	93	0.579	J	2.1	J	1.06	1.02	0.908	U	0.908	U
Pentachlorodibenzofuran homologs	15	15	100	0.194		1.46	T	0.830	0.830	na		na	
Pentachlorodibenzo-p-dioxin homologs	15	9	60	0.091		0.248		0.149	0.119	0.145	U	0.15	U
Tetrachlorodibenzofuran homologs	15	15	100	3.24		8.43		5.15	5.15	na		na	
Tetrachlorodibenzo-p-dioxin homologs	15	7	47	0.173	T	0.291		0.244	0.126	0.0457	U	0.0498	U
Pesticides (µg/kg)													
2,4'-DDD	15	15	100	1.51		4.53		2.6	2.6	na		na	
2,4'-DDE	15	15	100	0.173	JT	0.957		0.52	0.52	na		na	
2,4'-DDT	15	15	100	0.653		2.87		1.7	1.7	na		na	
4,4'-DDD	15	15	100	9.2		24.9		16	16	na		na	
4,4'-DDE	15	15	100	59.1		156	T	91.8	91.8	na		na	
4,4'-DDT	15	15	100	2.61		7.49		4.4	4.4	na		na	
Aldrin	15	13	87	0.0103	J	0.0554	J	0.031	0.028	0.016	U	0.0389	U
alpha-Endosulfan	15	15	100	0.108	JT	0.803		0.35	0.35	na		na	
alpha-Hexachlorocyclohexane	15	15	100	0.013	J	0.0505	J	0.028	0.028	na		na	
beta-Endosulfan	15	12	80	0.142	JT	0.368	J	0.22	0.20	0.168	U	0.25	U
beta-Hexachlorocyclohexane	15	6	40	0.00592	JT	0.025	J	0.016	0.010	0.00765	U	0.0281	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
cis-Chlordane	15	15	100	1.45		4.81	T	2.64	2.64	na	na
cis-Nonachlor	15	15	100	1		3.43	T	1.6	1.6	na	na
delta-Hexachlorocyclohexane	15	0	0	nd		nd		nd	0.0280	0.0237	U
Dieldrin	15	15	100	1.24		3.11		1.96	1.96	na	na
Endosulfan sulfate	15	15	100	0.747		2.23		1.34	1.34	na	na
Endrin	15	11	73	0.0314	JT	0.107	J	0.065	0.055	0.0291	U
Endrin aldehyde	15	0	0	nd		nd		nd	0.033	0.002	UT
Endrin ketone	15	3	20	0.008	J	0.012	J	0.010	0.035	0.0656	UT
gamma-Hexachlorocyclohexane	15	13	87	0.0123	J	0.0618	J	0.033	0.030	0.017	U
Heptachlor	15	1	7	0.0033	J	0.0033	J	0.0033	0.015	0.00344	UT
Heptachlor epoxide	15	15	100	0.16	J	0.5		0.30	0.30	na	na
Methoxychlor	15	0	0	nd		nd		nd	0.023	0.0198	U
Oxychlordane	15	15	100	0.224	J	1.02	T	0.40	0.40	na	na
Sum DDD (calc'd)	15	15	100	11		29.4		19	19	na	na
Sum DDE (calc'd)	15	15	100	59.5		156	J	92	92	na	na
Sum DDT (calc'd)	15	15	100	3.26		10.2		6.1	6.1	na	na
Total Chlordane (calc'd)	15	15	100	6.22	J	20		9.9	9.9	na	na
Total DDTs (calc'd)	15	15	100	77.9		180	J	120	120	na	na
Total Endosulfan (calc'd)	15	15	100	1.07	J	3.4	J	1.9	1.9	na	na
trans-Chlordane	15	15	100	0.769		1.88		1.23	1.23	na	na
trans-Nonachlor	15	15	100	2.59		9.8	T	4.2	4.2	na	na
Conventionals (%)											
Lipids	15	15	100	2.59		8.45		5.29	5.29	na	na
Total solids	15	15	100	24.5		31.3		28	28	na	na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations					
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL					
Sturgeon – Stomach Contents														
Metals (mg/kg)														
Aluminum	3	3	100	75.9	JT	3740	J	1,380	1,380	na	na			
Antimony	3	0	0	nd		nd		nd	0.0018	0.003	U			
Arsenic	3	3	100	0.17	T	0.82		0.45	0.45	na	na			
Cadmium	3	3	100	0.008	T	0.054		0.033	0.033	na	na			
Chromium	3	3	100	0.15	JT	4.1		1.6	1.6	na	na			
Copper	3	3	100	6.73	J	11	J	8.5	8.5	na	na			
Lead	3	3	100	0.103	T	1.5		0.58	0.58	na	na			
Mercury	3	3	100	0.0073	J	0.0119	J	0.010	0.010	na	na			
Nickel	3	3	100	0.267		2.33		1.08	1.08	na	na			
Selenium	3	2	67	0.2	J	0.3		0.25	0.18	0.1	UT			
Silver	3	3	100	0.027	JT	0.068	J	0.049	0.049	na	na			
Zinc	3	3	100	9.56	T	19.1		15.8	15.8	na	na			
PAHs (µg/kg)														
2-Methylnaphthalene	3	3	100	0.46	J	200		67	67	na	na			
Acenaphthene	3	3	100	0.26	J	480		160	160	na	na			
Acenaphthylene	3	2	67	0.14	J	38		19	13	0.069	U			
Anthracene	3	3	100	0.27	J	230		77	77	na	na			
Benzo(a)anthracene	3	2	67	3.4		420		210	140	0.066	U			
Benzo(a)pyrene	3	2	67	2.2		210		110	71	0.081	U			
Benzo(b)fluoranthene	3	2	67	4.5		210		110	72	0.07	U			
Benzo(g,h,i)perylene	3	2	67	0.74		240		120	80	0.073	U			
Benzo(k)fluoranthene	3	2	67	2.4		270		140	91	0.056	U			
Chrysene	3	2	67	5.6		580		290	200	0.076	U			
Dibenzo(a,h)anthracene	3	1	33	40		40		40	13	0.059	U			

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
Fluoranthene	3	3	100	0.47	J	1300		440	440	na	na
Fluorene	3	3	100	0.29	J	330		110	110	na	na
Indeno(1,2,3-cd)pyrene	3	2	67	1		250		130	84	0.064	U
Naphthalene	3	1	33	260		260		260	87	1.4	U
Phenanthrene	3	3	100	0.76		2300		770	770	na	na
Pyrene	3	3	100	0.51		1600		540	540	na	na
Total Benzofluoranthenes	3	2	67	6.9		480		240	160	0.07	U
Total HPAHs	3	3	100	1.3	J	5100		1,700	1,700	na	na
Total LPAHs	3	3	100	3.3	J	3800		1,300	1,300	na	na
Total PAHs	3	3	100	4.7	J	9000		3,000	3,000	na	na
SVOCs (µg/kg)											
Hexachlorobenzene	1	1	100	0.161	J	0.161	J	0.161	0.161	na	na
Hexachlorobutadiene	1	0	0	nd		nd		nd	0.00755	0.0151	UJ
PCB Congeners (pg/g)											
PCB TEQ – birds	1	1	100	0.419		0.419		0.419	0.419	na	na
PCB TEQ – fish	1	1	100	0.00702		0.007		0.00702	0.00702	na	na
PCB TEQ – mammals	1	1	100	0.186		0.186		0.186	0.186	na	na
PCB TEQ – mammals 2006	1	1	100	0.0817		0.0817		0.0817	0.0817	na	na
PCB 001	1	0	0	nd		nd		nd	0.161	0.322	U
PCB 002	1	0	0	nd		nd		nd	0.0755	0.151	U
PCB 003	1	0	0	nd		nd		nd	0.131	0.262	U
PCB 004	1	1	100	0.725	J	0.725	J	0.725	0.725	na	na
PCB 005	1	0	0	nd		nd		nd	0.117	0.233	UJ
PCB 006	1	1	100	0.25	J	0.25	J	0.250	0.250	na	na
PCB 007	1	0	0	nd		nd		nd	0.146	0.291	UJ
PCB 008	1	0	0	nd		nd		nd	0.615	1.23	UJ

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations				
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL			
PCB 009	1	0	0	nd		nd		nd	0.146	0.291	UJ	0.291	UJ
PCB 010	1	0	0	nd		nd		nd	0.117	0.233	UJ	0.233	UJ
PCB 011	1	1	100	3.59	J	3.59	J	3.59	3.59	na		na	
PCB 012 & 013	1	0	0	nd		nd		nd	0.163	0.326	UJ	0.326	UJ
PCB 014	1	0	0	nd		nd		nd	0.198	0.396	UJ	0.396	UJ
PCB 015	1	1	100	3.08		3.08		3.08	3.08	na		na	
PCB 016	1	0	0	nd		nd		nd	0.258	0.516	U	0.516	U
PCB 017	1	1	100	1.29		1.29		1.29	1.29	na		na	
PCB 018 & 030	1	0	0	nd		nd		nd	1.33	2.65	U	2.65	U
PCB 019	1	1	100	1.13		1.13		1.13	1.13	na		na	
PCB 020 & 028	1	1	100	44.3		44.3		44.3	44.3	na		na	
PCB 021 & 033	1	0	0	nd		nd		nd	1.18	2.35	U	2.35	U
PCB 022	1	1	100	1.92		1.92		1.92	1.92	na		na	
PCB 023	1	0	0	nd		nd		nd	0.157	0.314	U	0.314	U
PCB 024	1	0	0	nd		nd		nd	0.0990	0.198	U	0.198	U
PCB 025	1	0	0	nd		nd		nd	0.273	0.546	U	0.546	U
PCB 026 & 029	1	1	100	1.62		1.62		1.62	1.62	na		na	
PCB 027	1	1	100	0.54		0.54		0.540	0.540	na		na	
PCB 031	1	1	100	10.7		10.7		10.7	10.7	na		na	
PCB 032	1	1	100	4.4		4.4		4.40	4.40	na		na	
PCB 034	1	0	0	nd		nd		nd	0.0605	0.121	U	0.121	U
PCB 035	1	0	0	nd		nd		nd	0.0505	0.101	U	0.101	U
PCB 036	1	0	0	nd		nd		nd	0.221	0.442	U	0.442	U
PCB 037	1	1	100	5.91		5.91		5.91	5.91	na		na	
PCB 038	1	0	0	nd		nd		nd	0.175	0.349	U	0.349	U
PCB 039	1	0	0	nd		nd		nd	0.0575	0.115	U	0.115	U

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations	
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
PCB 040 & 041 & 071	1	1	100	12.6		12.6	12.6	na	
PCB 042	1	1	100	1.47		1.47	1.47	na	
PCB 043	1	1	100	0.95		0.95	0.950	na	
PCB 044 & 047 & 065	1	1	100	144		144	144	na	
PCB 045 & 051	1	1	100	4.16		4.16	4.16	na	
PCB 046	1	1	100	0.251	J	0.251	0.251	na	
PCB 048	1	1	100	1.71		1.71	1.71	na	
PCB 049 & 069	1	1	100	33.5		33.5	33.5	na	
PCB 050 & 053	1	1	100	6.81		6.81	6.81	na	
PCB 052	1	1	100	64.2		64.2	64.2	na	
PCB 054	1	1	100	0.716		0.716	0.716	na	
PCB 055	1	0	0	nd		nd	0.216	0.431	U
PCB 056	1	1	100	2.73		2.73	2.73	na	
PCB 057	1	1	100	0.173	J	0.173	0.173	na	
PCB 058	1	1	100	0.194	J	0.194	0.194	na	
PCB 059 & 062 & 075	1	1	100	5.55		5.55	5.55	na	
PCB 060	1	1	100	26.9		26.9	26.9	na	
PCB 061 & 070 & 074 & 076	1	1	100	114		114	114	na	
PCB 063	1	1	100	8.08		8.08	8.08	na	
PCB 064	1	1	100	19.8		19.8	19.8	na	
PCB 066	1	1	100	131		131	131	na	
PCB 067	1	1	100	0.792		0.792	0.792	na	
PCB 068	1	1	100	2.85		2.85	2.85	na	
PCB 072	1	1	100	1.41		1.41	1.41	na	
PCB 073	1	1	100	1.25		1.25	1.25	na	
PCB 077	1	1	100	6.35		6.35	6.35	na	

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations		
				Minimum	Maximum	Mean Detected Value	Half RL	Minimum RL	Maximum RL	
PCB 078	1	0	0	nd	nd	nd	0.192	0.384	U	0.384
PCB 079	1	0	0	nd	nd	nd	0.357	0.713	U	0.713
PCB 080	1	0	0	nd	nd	nd	0.152	0.303	U	0.303
PCB 081	1	0	0	nd	nd	nd	0.194	0.387	U	0.387
PCB 082	1	0	0	nd	nd	nd	0.695	1.39	U	1.39
PCB 083 & 099	1	1	100	358	358	358	358	na		na
PCB 084	1	1	100	8.98	8.98	8.98	8.98	na		na
PCB 085 & 116 & 117	1	1	100	85.4	85.4	85.4	85.4	na		na
PCB 086 & 087 & 097 & 108 & 119 & 125	1	1	100	71.2	71.2	71.2	71.2	na		na
PCB 088 & 091	1	1	100	19.8	19.8	19.8	19.8	na		na
PCB 089	1	0	0	nd	nd	nd	0.140	0.279	U	0.279
PCB 090 & 101 & 113	1	1	100	185	185	185	185	na		na
PCB 092	1	1	100	48.3	48.3	48.3	48.3	na		na
PCB 093 & 095 & 098 & 100 & 102	1	1	100	120	120	120	120	na		na
PCB 094	1	1	100	1.17	1.17	1.17	1.17	na		na
PCB 096	1	1	100	0.486	0.486	0.486	0.486	na		na
PCB 103	1	1	100	3.17	3.17	3.17	3.17	na		na
PCB 104	1	1	100	0.364	J	0.364	0.364	na		na
PCB 105	1	1	100	154	154	154	154	na		na
PCB 106	1	0	0	nd	nd	nd	0.106	0.212	U	0.212
PCB 107 & 124	1	1	100	3.14	3.14	3.14	3.14	na		na
PCB 109	1	1	100	43.9	43.9	43.9	43.9	na		na
PCB 110 & 115	1	1	100	154	154	154	154	na		na
PCB 111	1	1	100	1.43	1.43	1.43	1.43	na		na
PCB 112	1	0	0	nd	nd	nd	0.0875	0.175	U	0.175
PCB 114	1	1	100	13.7	13.7	13.7	13.7	na		na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations	
				Minimum	Maximum	Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
PCB 118	1	1	100	416	416	416	416	na	na
PCB 120	1	1	100	3.97	3.97	3.97	3.97	na	na
PCB 121	1	1	100	1.28	1.28	1.28	1.28	na	na
PCB 122	1	0	0	nd	nd	nd	0.128	0.256	U
PCB 123	1	0	0	nd	nd	nd	2.55	5.09	U
PCB 126	1	0	0	nd	nd	nd	0.468	0.935	U
PCB 127	1	0	0	nd	nd	nd	0.112	0.224	U
PCB 128 & 166	1	1	100	97.9	97.9	97.9	97.9	na	na
PCB 129 & 138 & 160 & 163	1	1	100	1190	1190	1,190	1,190	na	na
PCB 130	1	1	100	37.6	37.6	37.6	37.6	na	na
PCB 131	1	1	100	0.886	0.886	0.886	0.886	na	na
PCB 132	1	1	100	47.4	47.4	47.4	47.4	na	na
PCB 133	1	1	100	32.3	32.3	32.3	32.3	na	na
PCB 134 & 143	1	1	100	6.7	6.7	6.70	6.70	na	na
PCB 135 & 151 & 154	1	1	100	161	161	161	161	na	na
PCB 136	1	1	100	18.2	18.2	18.2	18.2	na	na
PCB 137	1	1	100	52.7	52.7	52.7	52.7	na	na
PCB 139 & 140	1	1	100	11.5	11.5	11.5	11.5	na	na
PCB 141	1	1	100	75.3	75.3	75.3	75.3	na	na
PCB 142	1	0	0	nd	nd	nd	0.150	0.299	U
PCB 144	1	1	100	11	11	11.0	11.0	na	na
PCB 145	1	0	0	nd	nd	nd	0.0930	0.186	U
PCB 146	1	1	100	287	287	287	287	na	na
PCB 147 & 149	1	1	100	288	288	288	288	na	na
PCB 148	1	1	100	4.27	4.27	4.27	4.27	na	na
PCB 150	1	1	100	0.712	0.712	0.712	0.712	na	na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations		
				Minimum	Maximum	Mean Detected Value	Half RL	Minimum RL	Maximum RL	
PCB 152	1	1	100	0.489	0.489	0.489	0.489	na	na	
PCB 153 & 168	1	1	100	1450	1450	1,450	1,450	na	na	
PCB 155	1	1	100	0.768	0.768	0.768	0.768	na	na	
PCB 156 & 157	1	1	100	138	138	138	138	na	na	
PCB 158	1	1	100	88.6	88.6	88.6	88.6	na	na	
PCB 159	1	1	100	5.85	5.85	5.85	5.85	na	na	
PCB 161	1	0	0	nd	nd	nd	0.140	0.279	U	0.279
PCB 162	1	1	100	4.07	4.07	4.07	4.07	na	na	
PCB 164	1	1	100	40.6	40.6	40.6	40.6	na	na	
PCB 165	1	1	100	1.87	1.87	1.87	1.87	na	na	
PCB 167	1	1	100	47.1	47.1	47.1	47.1	na	na	
PCB 169	1	0	0	nd	nd	nd	0.355	0.71	U	0.71
PCB 170	1	1	100	360	360	360	360	na	na	
PCB 171 & 173	1	1	100	95.4	95.4	95.4	95.4	na	na	
PCB 172	1	1	100	67.9	67.9	67.9	67.9	na	na	
PCB 174	1	1	100	100	100	100	100	na	na	
PCB 175	1	1	100	14.9	14.9	14.9	14.9	na	na	
PCB 176	1	1	100	7.33	7.33	7.33	7.33	na	na	
PCB 177	1	1	100	206	206	206	206	na	na	
PCB 178	1	1	100	91.3	91.3	91.3	91.3	na	na	
PCB 179	1	1	100	33.1	33.1	33.1	33.1	na	na	
PCB 180 & 193	1	1	100	1240	1240	1,240	1,240	na	na	
PCB 181	1	1	100	3.81	3.81	3.81	3.81	na	na	
PCB 182	1	1	100	2.8	2.8	2.80	2.80	na	na	
PCB 183 & 185	1	1	100	255	255	255	255	na	na	
PCB 184	1	0	0	nd	nd	nd	0.250	0.5	U	0.5

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations				Non-Detected Concentrations			
				Minimum	Maximum	Mean Detected Value	Half RL	Minimum RL	Maximum RL		
PCB 186	1	0	0	nd	nd	nd	0.0580	0.116	U	0.116	U
PCB 187	1	1	100	782	782	782	782	na		na	
PCB 188	1	1	100	2.15	2.15	2.15	2.15	na		na	
PCB 189	1	1	100	16.2	16.2	16.2	16.2	na		na	
PCB 190	1	1	100	62.4	62.4	62.4	62.4	na		na	
PCB 191	1	1	100	18.1	18.1	18.1	18.1	na		na	
PCB 192	1	0	0	nd	nd	nd	0.117	0.233	U	0.233	U
PCB 194	1	1	100	160	160	160	160	na		na	
PCB 195	1	1	100	72.5	72.5	72.5	72.5	na		na	
PCB 196	1	1	100	99.9	99.9	99.9	99.9	na		na	
PCB 197 & 200	1	1	100	13	13	13.0	13.0	na		na	
PCB 198 & 199	1	1	100	195	195	195	195	na		na	
PCB 201	1	1	100	27.3	27.3	27.3	27.3	na		na	
PCB 202	1	1	100	48.2	48.2	48.2	48.2	na		na	
PCB 203	1	1	100	99.4	99.4	99.4	99.4	na		na	
PCB 204	1	0	0	nd	nd	nd	0.0660	0.132	U	0.132	U
PCB 205	1	1	100	4.9	4.9	4.90	4.90	na		na	
PCB 206	1	1	100	32.9	32.9	32.9	32.9	na		na	
PCB 207	1	1	100	8.43	8.43	8.43	8.43	na		na	
PCB 208	1	1	100	15.5	15.5	15.5	15.5	na		na	
PCB 209	1	1	100	21.9	21.9	21.9	21.9	na		na	
Total PCB congeners	1	1	100	10600	J	10600	J	10,600	10,600	na	na
Pesticides (µg/kg)											
2,4'-DDD	1	1	100	0.052	J	0.052	J	0.052	0.052	na	na
2,4'-DDE	1	1	100	0.00776	J	0.0078	J	0.00776	0.00776	na	na
2,4'-DDT	1	1	100	0.0348	J	0.0348	J	0.0348	0.0348	na	na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
4,4'-DDD	1	1	100	0.168	J	0.168	J	0.168	0.168	na	na
4,4'-DDE	1	1	100	3.18		3.18		3.18	3.18	na	na
4,4'-DDT	1	1	100	0.163	J	0.163	J	0.163	0.163	na	na
Aldrin	1	1	100	0.00442	J	0.0044	J	0.00442	0.00442	na	na
alpha-Endosulfan	1	0	0	nd		nd		nd	0.00915	0.0183	U
alpha-Hexachlorocyclohexane	1	0	0	nd		nd		nd	0.131	0.262	U
beta-Endosulfan	1	0	0	nd		nd		nd	0.0162	0.0323	U
beta-Hexachlorocyclohexane	1	0	0	nd		nd		nd	0.0208	0.0415	U
cis-Chlordane	1	1	100	0.214	J	0.214	J	0.214	0.214	na	na
cis-Nonachlor	1	1	100	0.126	J	0.126	J	0.126	0.126	na	na
delta-Hexachlorocyclohexane	1	0	0	nd		nd		nd	0.0202	0.0403	U
Dieldrin	1	1	100	0.359		0.359		0.359	0.359	na	na
Endosulfan sulfate	1	1	100	0.109	J	0.109	J	0.109	0.109	na	na
Endrin	1	0	0	nd		nd		nd	0.0151	0.0302	U
Endrin aldehyde	1	0	0	nd		nd		nd	0.0286	0.0571	U
Endrin ketone	1	0	0	nd		nd		nd	0.0286	0.0571	U
gamma-Hexachlorocyclohexane	1	0	0	nd		nd		nd	0.00940	0.0188	U
Heptachlor	1	0	0	nd		nd		nd	0.0123	0.0245	U
Heptachlor epoxide	1	1	100	0.0265	J	0.0265	J	0.0265	0.0265	na	na
Methoxychlor	1	0	0	nd		nd		nd	0.0168	0.0336	U
Oxychlordane	1	1	100	0.171	J	0.171	J	0.171	0.171	na	na
Sum DDD	1	1	100	0.22	J	0.22	J	0.22	0.22	na	na
Sum DDE	1	1	100	3.19	J	3.19	J	3.19	3.19	na	na
Sum DDT	1	1	100	0.198	J	0.198	J	0.198	0.198	na	na
Total Chlordane	1	1	100	0.914	J	0.914	J	0.914	0.914	na	na
Total DDTs	1	1	100	3.6	J	3.6	J	3.6	3.6	na	na

DRAFT DOCUMENT: DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Table 4-5. Summary Statistics of Chemical Concentrations for Whole-Body Tissue and Stomach Content Samples

Chemical	N	N Detected	% Detected	Detected Concentrations					Non-Detected Concentrations		
				Minimum		Maximum		Mean Detected Value	Mean Detected Value or Half RL	Minimum RL	Maximum RL
Total Endosulfan	1	1	100	0.134	J	0.134	J	0.134	0.134	na	na
trans-Chlordane	1	1	100	0.0466	J	0.0466	J	0.0466	0.0466	na	na
trans-Nonachlor	1	1	100	0.356	J	0.356	J	0.356	0.356	na	na
Conventionals (%)											
Lipids	3	3	100	0.37	T	1.7		0.95	0.95	na	na
Total solids	3	3	100	12.9		20.7	T	17.8	17.8	na	na

Note: The potential effects of the bait contaminants on whole-body tissue and stomach content results are discussed in Section 3.2.2 of Appendix B.

5.0 REFERENCES

Beamesderfer RCP, J.C. Elliott JC, C.A. Foster CA. 1998. Methods for ageing Columbia River white sturgeon from pectoral fin rays. Report A. 1) Description of the life history and population dynamics of subadult and adult white sturgeon in the Columbia River between Bonneville and McNary dams, and 2) Evaluation of the need and identification of potential methods for protecting, mitigating, and enhancing white sturgeon populations in the Columbia River downstream from McNary Dam. In: Nigro AA, ed, Status and habitat requirements of white sturgeon populations in the Columbia River downstream from McNary Dam. Annual progress report to Bonneville Power Administration, Portland, Oregon. Oregon Department of Fish and Wildlife, Portland, OR, pp 5-52. December 1998.

EPA. 1995. EPA Region 10 SOP For the validation of Method 1668 toxic, dioxin-like, PCB data. Revision 1.0. Environmental Services Division, US Environmental Protection Agency, Region 10, Seattle, WA. December 8, 1995.

EPA. 1996. EPA Region 10 SOP for the validation of polychlorinated dibenzodioxin (PCDD) and polychlorinated dibenzofuran (PCDF) data. Revision 2.0. Environmental Services Division, US Environmental Protection Agency, Region 10, Seattle, WA. January 31, 1996.

EPA. 1999a. Method 1668, Revision A: chlorinated biphenyl congeners in water, soil, sediment, and tissue by HRGC/HRMS. EPA-821-R-00-002. US Environmental Protection Agency, Washington, DC.

EPA. 1999b. USEPA contract laboratory program national functional guidelines for organic data review. EPA-540/R-99/008. Office of Emergency and Remedial Response, US Environmental Protection Agency, Washington, DC. October 1999.

EPA. 2002a. Guidance on environmental data verification and data validation. EPA QA/G-8. EPA/240/R-02/004. Office of Environmental Information, US Environmental Protection Agency, Washington, DC. November 2002.

EPA. 2002b. USEPA contract laboratory program national functional guidelines for inorganic data review. EPA 540-R-01-008. Office of Emergency and Remedial Response, US Environmental Protection Agency, Washington, DC. July 2002.

EPA. 2004. USEPA contract laboratory program national functional guidelines for inorganic data review. EPA 540-R-04-004. Office of Emergency and Remedial Response, US Environmental Protection Agency, Washington, DC. October 2004.

Integral. 2007. Portland Harbor RI/FS: Standard operating procedure for homogenization of sturgeon tissue for the Portland Harbor RI/FS. Draft. IC07-0015. Prepared for Lower Willamette Group. Integral Consulting, Inc., Mercer Island, WA. June 18, 2007.

Integral, Windward. 2004. Portland Harbor RI/FS: Round 2 quality assurance project plan. Prepared for Lower Willamette Group. Integral Consulting, Inc., Mercer Island, WA and Windward Environmental LLC, Seattle, WA. June 24, 2004.

Integral, Windward. 2005. Portland Harbor RI/FS: Round 2 quality assurance project plan addendum 6: sampling of benthic invertebrate tissue. IC-05-0032. Prepared for the Lower Willamette Group. Integral Consulting, Inc., Mercer Island, WA; Windward Environmental, LLC, Seattle, WA. November 23, 2005.

Integral, Windward, Kennedy/Jenks, Anchor, Groundwater Solutions. 2004. Portland Harbor RI/FS programmatic work plan. Prepared for Lower Willamette Group. Integral Consulting, Inc., Mercer Island, WA; Windward Environmental LLC, Seattle, WA; Kennedy/Jenks Consultants, Portland, OR; Anchor Environmental, LLC, Seattle, WA; Groundwater Solutions, Inc., Portland, OR. April 23, 2004.

Kennedy/Jenks, Integral, Windward. 2004. Portland Harbor RI/FS technical memorandum: Guidelines for data reporting, data averaging, and treatment of non-detected values for the Round 1 database. Kennedy/Jenks Consultants, Portland, OR; Integral Consulting, Inc., Bellevue, WA; Windward Environmental LLC, Seattle, WA. June 10, 2004.

Krone CA, Brown DW, Burrows DG, Bogar RG, Chan S, Varanasi U. 1989. A method for analysis of butyltin species and measurement of butyltins in sediment and English sole livers from Puget Sound. Mar Environ Res 27:1-18.

NOAA. 1993. Tissue lipid determination method. In: Sampling and analytical methods of the National Status and Trends Program national benthic surveillance and mussel watch projects, 1984-1992. Vol 2: Comprehensive descriptions of complementary measurements. NOAA technical memorandum NOS ORCA 71. National Status and Trends Program, National Oceanic and Atmospheric Administration, Silver Spring, MD. July 1993.

Windward. 2007a. Portland Harbor RI/FS. Field sampling plan: round 3 sampling for pre-breeding white sturgeon (*Acipenser transmontanus*) tissue. Draft. WE-06-0004. Prepared for Lower Willamette Group. Windward Environmental LLC, Seattle, WA. December 21, 2006.

Windward. 2007b. Portland Harbor RI/FS. Round 3 sampling for pre-breeding white sturgeon (*Acipenser transmontanus*) tissue: field sampling report. Draft. WE-07-0002. Prepared for Lower Willamette Group. Windward Environmental LLC, Seattle, WA. May 1, 2007.

